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☐ 1. Document ID: US 20050009741 A1

L34: Entry 1 of 22 File: PGPB Jan 13, 2005

DOCUMENT-IDENTIFIER: US 20050009741 A1
TITLE: Ionic molecular conjugates of N-acylated derivatives of poly(2-amino-2-deoxy-D-glucose) and polypeptides

Summary of Invention Paragraph:
[0021] Preferred embodiments of the present invention include a copolymer wherein the first acyl group is succinyl and the second acyl group is acetyl and R.sub.7 is COH or CH.sub.2OH; a composition comprising said copolymer of claim 1 and H-.beta.-D-Nal-Cys-Tyr-D-Trp-Lys-Val-Cys-Thr-NH.- sub.2 or a pharmaceutically acceptable salt thereof, wherein the two Cys are bonded by a disulfide bond, where at least 50 percent, by weight, of H-.beta.-D-Nal-Cys-Tyr-D-Trp-Lys-Val-Cys-Thr-NH.sub.2 or a pharmaceutically acceptable salt thereof, present in said composition is ionically bound to said copolymer; a composition comprising the foregoing copolymer and a peptide selected from the group consisting of 2

Summary of Invention Paragraph:
[0023] Further preferred embodiments of the present invention include a copolymer wherein the first acyl group is glutaryl and the second acyl group is propionyl and R.sub.7 is COH or CH.sub.2OH; a composition comprising the foregoing copolymer and H-.beta.-D-Nal-Cys-Tyr-D-Trp-Lys-V- al-Cys-Thr-NH.sub.2, wherein the two Cys are bonded by a disulfide bond, where at least 50 percent, by weight, of H-.beta.-D-Nal-Cys-Tyr-D-Trp-Lys- -Val-Cys-Thr-NH.sub.2, present in said composition is ionically bound to said copolymer; a composition comprising the foregoing copolymer and a peptide selected from the group consisting of 3

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

☐ 2. Document ID: US 20040161403 A1

L34: Entry 2 of 22 File: PGPB Aug 19, 2004

DOCUMENT-IDENTIFIER: US 20040161403 A1
TITLE: Multi-arm polypeptide-poly (ethylene glycol) block copolymers as drug delivery vehicles

CLAIMS:

39. The unimolecular multi-arm block copolymer of claim 1, having the structure: (T-D-L.sub.2-C-L.sub.1-B-O-).sub.pA(-O-B-L1-C-L2-D-E).sub.k wherein: A is a central core molecule comprising a residue of a polyol, O is oxygen, B is a hydrophilic oligomer, C is a polypeptide segment, D is a hydrophilic polymer segment, E is a capping group or a functional group, T is a targeting moiety, L.sub.1 and L.sub.2 are linkages, (p) is at least 1, (k) is at least 1, and the sum of (p) and (k) is from 3 to about 25.

☐ 3. Document ID: US 20040126900 A1

L34: Entry 3 of 22 File: PGPB Jul 1, 2004

DOCUMENT-IDENTIFIER: US 20040126900 A1
TITLE: High affinity peptide- containing nanoparticles

Detail Description Paragraph:
[0159] Following the method of Deming (Deming, T. J., Nature 1997, 390, 386-389; Deming, T. J., J. Am. Chem. Soc. 1997, 119, 2759-2760) poly(leucine) (Mw=2200) is prepared from the polymerization of leucine N-carboxyanhydride. In this case, the nickel polymerization catalyst is prepared with the HAP to interleukin-2 serving as the initiating ligand following the method of Curtin (Curtin, S. A., Deming, T. J., J. Am. Chem. Soc., 1999, 121, 7427-7428). In this case, the amine terminus of the interleukin-2 is protected with the allyloxycarbonyl (Alloc) protecting group, while the rest of the HAP to interleukin-2 is protected with other protecting groups commonly used in peptide synthesis. This HAP/poly(leucine) complex is then coupled to the carboxylate terminus of the protected peptide Arg-Gly-Asp-D Phe-Lys, by the action of 1,3-dicyclohexylcarbodiimide in DMF. The DMF is removed under vacuum, and the resulting solids are washed extensively with chloroform to remove the urea side product. After deprotection of the Hap to interleukin-2 and the peptide Arg-Gly-Asp-D Phe-Lys, the HAP to interleukin-2/poly (leucine)/pep- tide block copolymer is dissolved in DMF and added dropwise to an aqueous solution of interleukin-2. The resulting aqueous solution is dialyzed to remove DMF.

☐ 4. Document ID: US 20040022726 A1

L34: Entry 4 of 22 File: PGPB Feb 5, 2004

DOCUMENT-IDENTIFIER: US 20040022726 A1
TITLE: Methods and compositions for intravesical therapy of bladder cancer

Summary of Invention Paragraph:
[0051] Any aspect of the present can be wherein the carrier molecule is a polymer of the structure [HSG].sub.m-polymer backbone-[DOTA-therapeutic agent].sub.n wherein HSG comprises a recognition hapten wherein m.gtoreq.1 and n.gtoreq.1. (M can be 1 or 2, and n can from 1 to about 100.) The method of claim 1, wherein the carrier molecule can be a biocompatible polymer. The carrier molecule can be a polyamino acid or polypeptide, wherein the amino acids are D-, L-

, or both. The carrier molecule can be a polyamino acid or polypeptide selected from the group consisting of polylysine, polyglutamic acid, polyaspartic acid, a poly(Lys-Glu) co-polymer, a poly(Lys-Asp) copolymer, a poly(Lys-Ala-Glu-Tyr) (KAEY; 5:6:2:1) co-polymer or a polypeptides of from 2-50 residues chain length. The carrier molecule can be selected from the group consisting of poly(ethylene) glycol (PEG), N-(2-hydroxypropyl)methacrylamide (HMPA) copolymers, poly(styrene-co-maleic acid/anhydride (SMA), poly(divinylether maleic anhydride) (DIVEMA), polyethyleneimine, ethoxylated polyethyleneimine, dendrimers, poly(N-vinylpyrrolidone) (PVP) epsilon-[histaminyl-succinyl-g- lycyl]-lysine amide, and apo-metallothionein coupled to p-bromoacetamido-benzyl-DTPA. The carrier molecule can be an immunogenic agent to which secondary recognition antibodies can be raised.

CLAIMS:

18. The method of claim 17, wherein the carrier molecule is a polyamino acid or polypeptide selected from the group consisting of polylysine, polyglutamic acid, polyaspartic acid, a poly (Lys-Glu) co-polymer, a poly(Lys-Asp) copolymer, a poly(Lys-Ala-Glu-Tyr) (KAEY; 5:6:2:1) co-polymer or a polypeptides of from 2-50 residues chain length.

51. The method of claim 50, wherein the carrier molecule is a polyamino acid or polypeptide selected from the group consisting of polylysine, polyglutamic acid, polyaspartic acid, a poly (Lys-Glu) co-polymer, a poly(Lys-Asp) copolymer, a poly(Lys-Ala-Glu-Tyr) (KAEY; 5:6:2:1) co-polymer or a polypeptides of from 2-50 residues chain length.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 5. Document ID: US 20030219383 A1

L34: Entry 5 of 22 File: PGPB Nov 27, 2003

DOCUMENT-IDENTIFIER: US 20030219383 A1
TITLE: Intramolecularly-quenched near infrared fluorescent probes

Detail Description Paragraph:
[0036] Probe backbone design will depend on considerations such as biocompatibility (e.g., toxicity and immunogenicity), serum half-life, useful functional groups (for conjugating fluorochromes, spacers, and protective groups), and cost. Useful types of backbone include polypeptides (polyamino acids), polyethyleneamines, polysaccharides, aminated polysaccharides, aminated oligosaccharides, polyamidoamines, polyacrylic acids and polyalcohols. In some embodiments the backbone consists of a polypeptide formed from L-amino acids, D-amino acids, or a combination thereof. Such a polypeptide can be, e.g., a polypeptide identical or similar to a naturally occurring protein such as albumin, a homopolymer such as polylysine, or a copolymer such as a D-tyr-D-lys copolymer. When lysine residues are present in the backbone, the .epsilon.-amino groups on the side chains of the lysine residues can serve as convenient reactive groups for covalent linkage of fluorochromes and spacers (FIGS. 1A and 1B). When the backbone is a polypeptide, preferably the molecular weight of the probe is from 2 kD to 1000 kD. More preferably, its molecular weight is from 4 kd to 500 kd.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 6. Document ID: US 20030092800 A1

L34: Entry 6 of 22 File: PGPB May 15, 2003

DOCUMENT-IDENTIFIER: US 20030092800 A1
TITLE: Ionic molecular conjugates of n-acylated derivatives of poly(2-amino-2-deoxy-d-glucose) and polypeptides

Summary of Invention Paragraph:
[0021] Preferred embodiments of the present invention include a copolymer wherein the first acyl group is succinyl and the second acyl group is acetyl and R.sub.7 is COH or CH.sub.2OH; a composition comprising said copolymer of claim 1 and H-.beta.-D-Nal-Cys-Tyr-D-Trp-Lys-Val-Cys-Thr-NH.- sub.2 or a pharmaceutically acceptable salt thereof, wherein the two Cys are bonded by a disulfide bond, where at least 50 percent, by weight, of H-.beta.-D-Nal-Cys-Tyr-D-Trp-Lys-Val-Cys-Thr-NH.sub.2 or a pharmaceutically acceptable salt thereof, present in said composition is ionically bound to said copolymer; a composition comprising the foregoing copolymer and a peptide selected from the group consisting of 2

Summary of Invention Paragraph:
[0023] Further preferred embodiments of the present invention include a copolymer wherein the first acyl group is glutaryl and the second acyl group is propionyl and R.sub.7 is COH or CH.sub.2OH; a composition comprising the foregoing copolymer and H-.beta.-D-Nal-Cys-Tyr-D-Trp-Lys-V- al-Cys-Thr-NH.sub.2, wherein the two Cys are bonded by a disulfide bond, where at least 50 percent, by weight, of H-.beta.-D-Nal-Cys-Tyr-D-Trp-Lys- -Val-Cys-Thr-NH.sub.2, present in said composition is ionically bound to said copolymer; a composition comprising the foregoing copolymer and a peptide selected from the group consisting of 3

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 7. Document ID: US 20030092145 A1

L34: Entry 7 of 22 File: PGPB May 15, 2003

DOCUMENT-IDENTIFIER: US 20030092145 A1
TITLE: Viral vaccine composition, process, and methods of use

Detail Description Paragraph:
[0101] Other typical carriers and adjuvants include, for example, ion exchangers, alumina, aluminum stearate, lecithin, serum proteins, such as human serum albumin, chitosan, buffer substances such as phosphates, glycine, sorbic acid, potassium sorbate, partial glyceride mixtures of saturated vegetable fatty acids, one or more saponin-lipophile conjugates, desacylsaponin, triterpene saponins, saponarin, sarmentocymarin, sapogenins, sarmentogenin, sarsasapogenin, sarverogenin, N-palmitoyl-S-2,3(bispalmitoyloxy)-propyl-cysteinyl-seryl-serine, an unsaturated turpin hydrocarbon, like squalene or squalane, a polyoxypropylene-polyoxyethylene block copolymer, anionic lipids like salts of lauric and oleic acids, lauric and oleic acids, acid esters of lauryl and cetyl alcohol, and sulfonates, lectins, estrogenic compounds, a peptide to which has been attached a hydrophobic tail, said peptide being adsorbed to viral particles comprising intact virus surface antigen attached via said hydrophobic tail, a synthetic peptide carrier which may constitute a T cell epitope, e.g., one derived from the which corresponds to positions 437-453 of E. coli hsp65 (GroEL), or an analog thereof, cyclic peptides containing as constituting strand(s) one or two amino acid sequences selected from among amino acid sequences Glu-Ala-Asp-Asp-Arg and/or Ser-Gln-Lys-Glu-Gly, peptide having the

amino acid sequence X-Ser-Ser-Ser-Gly-Arg-Met-Ile-Met-Glu-Lys-Gly-Glu-Ile-Lys-A- sn-Cys-Ser-Phe-Asn-Ile-Ser-Thr-Ser-Y wherein X is either a hydrogen atom of the amino terminal NH2 group of said peptide or an additional amino acid selected to facilitate coupling of said peptide to a carrier and Y is selected from the group consisting of an amino group, hydroxy group, cysteine residue, cysteine residue followed by an amino group and cysteine residue followed by a hydroxy group, hemagglutinin protein, BCG, diphtheria, tetanus, whole cell pertussis, polio, hepatitis B, hemophilus influenza, measles, mumps and rubella immunogens, or any other viral, fungal, bacterial, protozoan or parasite protein/immunogen that in combination can elicit desired immune response, hydroxylated lower alkyls, dimethyl sulfoxide, urea, water, salts or electrolytes such as protamine sulfate, disodium hydrogen phosphate, potassium hydrogen phosphate, sodium chloride, zinc salts, colloidal silica, magnesium trisilicate, polyvinyl pyrrolidone, cellulose-based substances and polyethylene glycol. Adjuvants for topical or gel base forms of the compounds and compositions of this invention include, but are not limited to, sodium carboxymethylcellulose, polyacrylates, waxes, polyoxyethylene-polyoxypropylene-block polymers, polyethylene glycol, propylene glycol and wool fat.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 8. Document ID: US 20030044353 A1

L34: Entry 8 of 22 File: PGPB Mar 6, 2003

DOCUMENT-IDENTIFIER: US 20030044353 A1
TITLE: Activatable imaging probes

Detail Description Paragraph:
[0053] The chromophore attachment moiety design will depend on considerations such as biocompatibility (e.g., toxicity and immunogenicity), serum half-life, useful functional groups (for conjugating chromophores, spacers, and protective groups), and cost. Useful types of chromophore attachment moieties, also referred to herein as "backbones," include polypeptides (polyamino acids), polyethyleneamines, polysaccharides, aminated polysaccharides, aminated oligosaccharides, polyamidoamines, polyacrylic acids, and polyalcohols. In some embodiments the backbone consists of a polypeptide formed from L-amino acids, D-amino acids, or a combination thereof. Such a polypeptide can be, e.g., a polypeptide identical or similar to a naturally occurring protein such as albumin, a homopolymer such as polylysine, or a copolymer such as a D-Tyr-D-Lys copolymer. When lysine residues are present in the backbone, the .epsilon.-amino "groups" on the side chains of the lysine residues can serve as convenient reactive groups for covalent linkage of chromophores and spacers (FIGS. 1A and 1B). When the backbone is a polypeptide, the molecular weight of the probe can be from 2 kD to 1000 kD, e.g., from 4 kD to 500 kD.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 9. Document ID: US 20020098206 A1

L34: Entry 9 of 22 File: PGPB Jul 25, 2002

DOCUMENT-IDENTIFIER: US 20020098206 A1
TITLE: IONIC MOLECULAR CONJUGATES OF N-ACYLATED DERIVATIVES OF POLY(2-AMINO-2-DEOXY-D-GLUCOSE) AND POLYPEPTIDES

Summary of Invention Paragraph:
[0021] Preferred embodiments of the present invention include a copolymer wherein the first acyl group is succinyl and the second acyl group is acetyl and R.sub.7 is COH or CH.sub.2OH; a composition comprising said copolymer of claim 1 and H-.beta.-D-Nal-Cys-Tyr-D-Trp-Lys-Val-Cys-Thr-NH.- sub.2 or a pharmaceutically acceptable salt thereof, wherein the two Cys are bonded by a disulfide bond, where at least 50 percent, by weight, of H-.beta.-D-Nal-Cys-Tyr-D-Trp-Lys-Val-Cys-Thr-NH.sub.2 or a pharmaceutically acceptable salt thereof, present in said composition is ionically bound to said copolymer; a composition comprising the foregoing copolymer and a peptide selected from the group consisting of 2

Summary of Invention Paragraph:
[0023] Further preferred embodiments of the present invention include a copolymer wherein the first acyl group is glutaryl and the second acyl group is propionyl and R.sub.7 is COH or CH.sub.2OH; a composition comprising the foregoing copolymer and H-P-D-Nal-Cys-Tyr-D-Trp-Lys-Val-Cy- s-Thr-NH.sub.2, wherein the two Cys are bonded by a disulfide bond, where at least 50 percent, by weight, of H-.beta.-D-Nal-Cys-Tyr-D-Trp-Lys-Val-C- ys-Thr-NH.sub.2, present in said composition is ionically bound to said copolymer; a composition comprising the foregoing copolymer and a peptide selected from the group consisting of 3

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 10. Document ID: US 20020058611 A1

L34: Entry 10 of 22 File: PGPB May 16, 2002

DOCUMENT-IDENTIFIER: US 20020058611 A1
TITLE: Carrier for in vivo delivery of a therapeutic agent

Detail Description Paragraph:
[0265] Initially, a Jurkat cell line was stably transfected with a TAR-CAT plasmid. At time (t) =0, the cells were transfected with a Tat-protein plasmid. The cells were then grown in 10% fetal calf serum for about 18 hours. At t=18 hours, the biotinylated Tat peptide inhibitor, having a sequence of SEQ ID NO:3, either free or appended to a carrier of the present invention via disulfide bond, wherein the carrier comprised a PEG/Lys copolymer having a molecular weight of about 27,000 D (2.69.times.10.sup.4 D) with cysteamine conjugated to the polymer, and a disulfide bond formed between the inhibitor having an amino acid of SEQ ID NO:3 and cysteamine, was added at each indicated concentration set forth in x axis of the graph of FIG. 7. At t=42 hours, the cells were harvested and CAT protein was measured by immunoassay. Each data point set forth in FIG. 7 is the average of 3 separate cell cultures. The data for the low concentrations of free and appended peptide were obtained in a side-by-side experiment, whereas the data for the high concentrations were obtained in separate experiments. The remaining 20-25% of CAT activity at high inhibitor concentrations most likely represents CAT protein already synthesized prior to addition of the inhibitor to the culture media and its uptake by the cells.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 11. Document ID: US 6794364 B2

L34: Entry 11 of 22 File: USPT Sep 21, 2004

DOCUMENT-IDENTIFIER: US 6794364 B2
TITLE: Ionic molecular conjugates of N-acylated derivatives of poly(2-amino-2-deoxy-D-glucose) and polypeptides

Brief Summary Text (12):
Preferred embodiments of the present invention include a copolymer wherein the first acyl group is succinyl and the second acyl group is acetyl and R.sub.7 is COH or CH.sub.2 OH; a composition comprising said copolymer of claim 1 and H-.beta.-D-Nal-Cys-Tyr-D-Trp-Lys-Val-Cys-Thr-NH.sub.2 or a pharmaceutically acceptable salt thereof, wherein the two Cys are bonded by a disulfide bond, where at least 50 percent, by weight, of H-.beta.-D-Nal-Cys-Tyr-D-Trp-Lys-Val-Cys-Thr-NH.sub.2 or a pharmaceutically acceptable salt thereof, present in said composition is ionically bound to said copolymer; a composition comprising the foregoing copolymer and a peptide selected from the group consisting of ##STR2## or a pharmaceutically acceptable salt thereof, where at least 50 percent, by weight, of said peptide or a pharmaceutically acceptable salt thereof present in said composition is ionically bound to said copolymer; a composition comprising the foregoing copolymer and a peptide selected from the group consisting of (p-Glu-His-Trp-Ser-Tyr-D-Trp-Leu-Arg-Pro-Gly-NH.sub.2), ([D-Ser(t-Bu).sup.6, des-Gly-NH.sub.2.sup.10]-LHRH(1-9)NHEt), ([D-Trp.sup.6, des-Gly-NH.sub.2.sup.10]-LHRH(1-9)NHEt, ([des-Gly-NH.sub.2.sup.10]-LHRH(1-9)NHEt), ([D-Ser(t-Bu).sup.6, Azgly.sup.10]-LHRH), ([D-His (Bzl).sup.6, des-Gly-NH.sub.2.sup.10]-LHRH(1-9)NHEt), ([D-Leu.sup.6, des-Gly-NH.sub.2.sup.10]-LHRH(1-9)NHEt), ([D-Trp.sup.6, MeLeu.sup.7, des-Gly-NH.sub.2.sup.10]-LHRH(1-9)NHEt), and ([D-Nal.sup.6]-LHRH, or a pharmaceutically acceptable salt thereof, where at least 50 percent, by weight, of said peptide or a pharmaceutically acceptable salt thereof, present in said composition is ionically bound to said copolymer; a composition comprising the foregoing copolymer and parathyroid hormone, an analogue thereof or a pharmaceutically acceptable salt thereof, where at least 50 percent, by weight, of parathyroid hormone, an analogue thereof or a pharmaceutically acceptable salt thereof, present in said composition is ionically bound to said copolymer.

Brief Summary Text (13):
Further preferred embodiments of the present invention include a copolymer wherein the first acyl group is glutaryl and the second acyl group is propionyl and R.sub.7 is COH or CH.sub.2 OH; a composition comprising the foregoing copolymer and H-.beta.-D-Nal-Cys-Tyr-D-Trp-Lys-Val-Cys-Thr-NH.sub.2, wherein the two Cys are bonded by a disulfide bond, where at least 50 percent, by weight, of H-.beta.-D-Nal-Cys-Tyr-D-Trp-Lys-Val-Cys-Thr-NH.sub.2, present in said composition is ionically bound to said copolymer; a composition comprising the foregoing copolymer and a peptide selected from the group consisting of ##STR3##

CLAIMS:

1. A composition comprising a copolymer and a peptide which said copolymer is an N-acylated derivative of poly(2-amino-2-deoxy-D-glucose) in which between 1 and 50 percent of the free amines of said poly(2-amino-2-deoxy-D-glucose) are acylated with a first acyl group, said first acyl group is COE.sub.1 where E.sub.1 is selected from the group consisting of C.sub.3-33 carboxyalkyl, C.sub.3-33 carboxyalkenyl, C.sub.7-39 carboxyarylalkyl, and C.sub.9-39 carboxyarylalkenyl, and between 50 and 99 percent of the free amines of said poly(2-amino-2-deoxy-D-glucose) are acylated with a second acyl group, said second acyl group is COE.sub.2 where E.sub.2 is selected from the group consisting of C.sub.1-30 alkyl, C.sub.2-30 alkenyl, C.sub.6-37 arylalkyl, and C.sub.8-37 arylalkenyl, provided at least one of the free amines of said poly(2-amino-2-deoxy-D-glucose) is acylated with said first acyl group and wherein said peptide is H-.beta.-D-Nal-Cys-Tyr-D-Trp-Lys-Val-Cys-Thr-NH.sub.2 or a pharmaceutically acceptable salt thereof, present in said composition is ionically bound to said copolymer, wherein said first acyl group is succinyl and said second acyl group is acetyl.

2. A composition comprising a copolymer and a peptide wherein said copolymer is an N-acylated derivative of poly(2-amino-2-deoxy-D-glucose), in which between 1 and 50 percent of the free amines of said poly(2-amino-2-deoxy-D-glucose) are acylated with glutaryl and between 50 and 99 percent of the free amines of said poly(2-amino-2-deoxy-D-glucose) are acylated with propionyl,

provided at least one of the free amines of said poly(2-amino-2-deoxy-D-glucose) is acylated with glutaryl and wherein said peptide is H-.beta.-D-Nal-Cys-Tyr-D-Trp-Lys-Val-Cys-Thr-NH.sub.2 or a pharmaceutically acceptable salt thereof, in which the two Cys are bonded by a disulfide bond, where at least 50 percent, by weight, of H-.beta.-D-Nal-Cys-Tyr-D-Trp-Lys-Val-Cys-Thr-NH.sub.2 or pharmaceutically acceptable salt thereof, present in said composition is ionically bound to said copolymer.

☐ 12. Document ID: US 6617306 B2

L34: Entry 12 of 22 File: USPT Sep 9, 2003

DOCUMENT-IDENTIFIER: US 6617306 B2
TITLE: Carrier for in vivo delivery of a therapeutic agent

Detailed Description Text (135):
Initially, a Jurkat cell line was stably transfected with a TAR-CAT plasmid. At time (t)=0, the cells were transfected with a Tat-protein plasmid. The cells were then grown in 10% fetal calf serum for about 18 hours. At t=18 hours, the biotinylated Tat peptide inhibitor, having a sequence of SEQ ID NO:3, either free or appended to a carrier of the present invention via disulfide bond, wherein the carrier comprised a PEG/Lys copolymer having a molecular weight of about 27,000 D (2.69.times.10.sup.4 D) with cysteamine conjugated to the polymer, and a disulfide bond formed between the inhibitor having an amino acid of SEQ ID NO:3 and cysteamine, was added at each indicated concentration set forth in x axis of the graph of FIG. 7. At t=42 hours, the cells were harvested and CAT protein was measured by immunoassay. Each data point set forth in FIG. 7 is the average of 3 separate cell cultures. The data for the low concentrations of free and appended peptide were obtained in a side-by-side experiment, whereas the data for the high concentrations were obtained in separate experiments. The remaining 20-25% of CAT activity at high inhibitor concentrations most likely represents CAT protein already synthesized prior to addition of the inhibitor to the culture media and its uptake by the cells.

☐ 13. Document ID: US 6592847 B1

L34: Entry 13 of 22 File: USPT Jul 15, 2003

DOCUMENT-IDENTIFIER: US 6592847 B1
TITLE: Intramolecularly-quenched near infrared flourescent probes

Detailed Description Text (5):
Probe backbone design will depend on considerations such as biocompatibility (e.g., toxicity and immunogenicity), serum half-life, useful functional groups (for conjugating fluorochromes, spacers, and protective groups), and cost. Useful types of backbone include polypeptides (polyamino acids), polyethyleneamines, polysaccharides, aminated polysaccharides, aminated oligosaccharides, polyamidoamines, polyacrylic acids and polyalcohols. In some embodiments the backbone consists of a polypeptide formed from L-amino acids, D-amino acids, or a combination

thereof. Such a polypeptide can be, e.g., a polypeptide identical or similar to a naturally occurring protein such as albumin, a homopolymer such as polylysine, or a copolymer such as a D-tyr-D-lys copolymer. When lysine residues are present in the backbone, the .epsilon.-amino groups on the side chains of the lysine residues can serve as convenient reactive groups for covalent linkage of fluorochromes and spacers (FIGS. 1A and 1B). When the backbone is a polypeptide, preferably the molecular weight of the probe is from 2 kD to 1000 kD. More preferably, its molecular weight is from 4 kd to 500 kd.

CLAIMS:

26. The probe of claim 24, wherein the polypeptide backbone is comprised of a D-tyr-D-lys copolymer.

70. The probe of claim 68, wherein the polypeptide backbone is comprised of a D-tyr-D-lys copolymer.

125. The probe of claim 123, wherein the polypeptide backbone is comprised of a D-tyr-D-lys copolymer.

☐ 14. Document ID: US 6479457 B2

L34: Entry 14 of 22 File: USPT Nov 12, 2002

DOCUMENT-IDENTIFIER: US 6479457 B2
TITLE: Ionic molecular conjugates of N-acylated derivatives of poly(2-amino-2-deoxy-D-glucose) and polypeptides

Brief Summary Text (12):
Preferred embodiments of the present invention include a copolymer wherein the first acyl group is succinyl and the second acyl group is acetyl and R.sub.7 is COH or CH.sub.2 OH; a composition comprising said copolymer of claim 1 and H-.beta.-D-Nal-Cys-Tyr-D-Trp-Lys-Val-Cys-Thr-NH.sub.2 or a pharmaceutically acceptable salt thereof, wherein the two Cys are bonded by a disulfide bond, where at least 50 percent, by weight, of H-.beta.-D-Nal-Cys-Tyr-D-Trp-Lys-Val-Cys-Thr-NH.sub.2 or a pharmaceutically acceptable salt thereof, present in said composition is ionically bound to said copolymer; a composition comprising the foregoing copolymer and a peptide selected from the group consisting of ##STR2## or a pharmaceutically acceptable salt thereof, where at least 50 percent, by weight, of said peptide or a pharmaceutically acceptable salt thereof present in said composition is ionically bound to said copolymer; a composition comprising the foregoing copolymer and a peptide selected from the group consisting of (p-Glu-His-Trp-Ser-Tyr-D-Trp-Leu-Arg-Pro-Gly-NH.sub.2), ([D-Ser(t-Bu).sup.6, des-Gly-NH.sub.2.sup.10]-LHRH(1-9)NHEt), ([D-Trp.sup.6, des-Gly-NH.sub.2.sup.10]-LHRH(1-9)NHEt, ([des-Gly-NH.sub.2.sup.10]-LHRH(1-9)NHEt), ([D-Ser(t-Bu).sup.6, Azgly.sup.10]-LHRH), ([D-His(Bzl).sup.6, des-Gly-NH.sub.2.sup.10]-LHRH(1-9)NHEt), ([D-Leu.sup.6, des-Gly-NH.sub.2.sup.10]-LHRH(1-9)NHEt), ([D-Trp.sup.6, MeLeu.sup.7, des-Gly-NH.sub.2.sup.10]-LHRH(1-9)NHEt), and ([D-Nal.sup.6]-LHRH, or a pharmaceutically acceptable salt thereof, where at least 50 percent, by weight, of said peptide or a pharmaceutically acceptable salt thereof, present in said composition is ionically bound to said copolymer; a composition comprising the foregoing copolymer and parathyroid hormone, an analogue thereof or a pharmaceutically acceptable salt thereof, where at least 50 percent, by weight, of parathyroid hormone, an analogue thereof or a pharmaceutically acceptable salt thereof, present in said composition is ionically bound to said copolymer.

Brief Summary Text (13):
Further preferred embodiments of the present invention include a copolymer wherein the first acyl group is glutaryl and the second acyl group is propionyl and R.sub.7 is COH or CH.sub.2 OH; a composition comprising the foregoing copolymer and H-.beta.-D-Nal-Cys-Tyr-D-Trp-Lys-Val-Cys-Thr-NH.sub.2, wherein the two Cys are bonded by a disulfide bond, where at least 50 percent, by weight, of H-.beta.-D-Nal-Cys-Tyr-D-Trp-Lys-Val-Cys-Thr-NH.sub.2, present in said composition is ionically bound to said copolymer; a composition comprising the foregoing copolymer and a peptide selected from the group consisting of ##STR3##

☐ 15. Document ID: US 6270700 B1

L34: Entry 15 of 22 File: USPT Aug 7, 2001

DOCUMENT-IDENTIFIER: US 6270700 B1
TITLE: Encapsulation of water soluble peptides

Brief Summary Text (37):
Preferred of the immediately foregoing process is where the polymer is polylactide-co-glycolide, polycaprolactone or polyanhydride or a copolymer or blends thereof and where the peptide is the LHRH analogue of the formula pyroGlu-His-Trp-Ser-Tyr-D-Trp-Leu-Arg-Pro-Gly-NH.sub.2 or the peptide is selected from the group of somatostatin analogues consisting of H-D-.beta.-Nal-Cys-Tyr-D-Trp-Lys-Thr-Cys-Thr-NH.sub.2, ##STR3##

☐ 16. Document ID: US 6258774 B1

L34: Entry 16 of 22 File: USPT Jul 10, 2001

DOCUMENT-IDENTIFIER: US 6258774 B1
**** See image for Certificate of Correction ****
TITLE: Carrier for in vivo delivery of a therapeutic agent

Detailed Description Text (203):
Initially, a Jurkat cell line was stably transfected with a TAR-CAT plasmid. At time (t)=0, the cells were transfected with a Tat-protein plasmid. The cells were then grown in 10 % fetal calf serum for about 18 hours. At t=18 hours, the biotinylated Tat peptide inhibitor, having a sequence of SEQ ID NO:3, either free or appended to a carrier of the present invention via disulfide bond, wherein the carrier comprised a PEG/Lys copolymer having a molecular weight of about 27,000 D (2.69.times.10.sup.4 D) with cysteamine conjugated to the polymer, and a disulfide bond formed between the inhibitor having an amino acid of SEQ ID NO:3 and cysteamine, was added at each indicated concentration set forth in x axis of the graph of FIG. 7. At t=42 hours, the cells were harvested and CAT protein was measured by immunoassay. Each data point set forth in FIG. 7 is the average of 3 separate cell cultures. The data for the low concentrations of free and appended peptide were obtained in a side-by-side experiment, whereas the data for the high concentrations were obtained in separate experiments. The remaining 20-

25% of CAT activity at high inhibitor concentrations most likely represents CAT protein already synthesized prior to addition of the inhibitor to the culture media and its uptake by the cells.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 17. Document ID: US 6146833 A

L34: Entry 17 of 22 File: USPT Nov 14, 2000

DOCUMENT-IDENTIFIER: US 6146833 A
TITLE: Polymeric reagents for immobilizing biopolymers

Other Reference Publication (14):
Nakajima, K., et al; Adsorption of Plasma Proteins on Arg-Gly-Asp-Ser Peptide-Immobilized Poly (vinyl alcohol) and Ethylene-Acrylic Acid Copolymer Films; Polymer Journal, vol. 22, No. 11, pp. 985-990 (1990).

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 18. Document ID: US 5939385 A

L34: Entry 18 of 22 File: USPT Aug 17, 1999

DOCUMENT-IDENTIFIER: US 5939385 A
TITLE: Transglutaminase cross-linkable polypeptides and methods relating thereto

Brief Summary Text (10):
In a related aspect, the present invention provides biocompatible, bioadhesive, transglutaminase cross-linkable copolymers which comprise: a) a first polypeptide monomer wherein said first polypeptide monomer comprises a polypeptide of from about 9-120 amino acid residues comprising a segment of the formula S.sub.1 -Y-S.sub.2, wherein: S.sub.1 is selected from the group consisting of Ile-Gly-Glu-Gly-Gln (SEQ ID NO:1), Gly-Glu-Gly-Gln (SEQ ID NO:2), Glu-Gly-Gln (SEQ ID NO:3), and Gly-Gln (SEQ ID NO:4); Y is His-His-Leu-Gly-Gly (SEQ ID NO:5) or His-His-Leu-Gly (SEQ ID NO:6); and S.sub.2 is selected from the group consisting of Ala-Lys-Gln-Ala-Gly-Asp (SEQ ID NO:7), Ala-Lys-Gln-Ala-Gly (SEQ ID NO:8), Ala-Lys-Gln-Ala (SEQ ID NO:9), Ala-Lys-Gln (SEQ ID NO:10), Ala-Lys-Ala-Gly-Asp-Val (SEQ ID NO:11), Ala-Lys-Ala (SEQ ID NO:12) and Ala-Lys (SEQ ID NO:13), wherein the first polypeptide monomer has an amino-terminus and a carboxy-terminus and is cross-linkable by a transglutaminase; and b) a second polypeptide monomer comprising a polypeptide capable of being non-enzymatically polymerized into soluble, biocompatible, bioadhesive polymers. A preferred transglutaminase is Factor XIII.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 19. Document ID: US 5916585 A

L34: Entry 19 of 22 File: USPT Jun. 29, 1999

DOCUMENT-IDENTIFIER: US 5916585 A
TITLE: Materials and method for the immobilization of bioactive species onto biodegradable polymers

Other Reference Publication (22):
Nakajima, K. et al. Adsorption of Plasma Proteins on Arg-Gly-Asp-Ser Peptide-Immobilized Poly (vinyl alcohol) and Ethylene-Acrylic Acid Copolymer Films. Polymer Journal 1990;v22 n11:985-990.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWMC | Draw Desc | Image

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☐ 20. Document ID: US 5480868 A

L34: Entry 20 of 22 File: USPT Jan 2, 1996

DOCUMENT-IDENTIFIER: US 5480868 A
TITLE: Sustained-release preparation

Detailed Description Text (110):
N-Tetrahydrofur-2-oyl-Gly-D2Nal-D4ClPhe-D3Pal-Ser -NMeTyr-Dlys(Nic)-Leu-Lys(Nisp)-Pro-DAlaNH.sub.2 (Manufactured by TAP; hereinafter referred to briefly as physiologically active peptide D) acetate [FAB mass spectrometry: m/e 1647 (M+H).sup.+], 240 mg, was dissolved in a solution of a 50:50 mixture (1.76 g) of the glycolic acid-2-hydroxybutyric acid copolymer obtained in Reference Example 9 and the polylactic acid obtained in Reference Example 8 in 3.2 g (2.4 ml) of dichloromethane. The resulting solution was cooled to 18.degree. C. and poured into 400 ml of a 0.1% aqueous solution of polyvinyl alcohol previously adjusted to 16.degree. C. and the mixture was treated as in Example 1 to provide microcapsules. The particle size distribution and physiologically active peptide D content of the microcapsules were 5 to 70 .mu.m and 10.5% (w/w), respectively.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWMC | Draw Desc | Image

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☐ 21. Document ID: US 5428014 A

L34: Entry 21 of 22 File: USPT Jun 27, 1995

DOCUMENT-IDENTIFIER: US 5428014 A
TITLE: Transglutaminase cross-linkable polypeptides and methods relating thereto

Brief Summary Text (9):
In a related aspect, the present invention provides biocompatible, bioadhesive, transglutaminase cross-linkable copolymers which comprise: a) a first polypeptide monomer wherein said first polypeptide monomer is selected from the group consisting of: i) a polypeptide of from 13-120 amino acid residues comprising a segment of the formula S.sub.1 -Y-S.sub.2, wherein: S.sub.1 is Thr-Ile-Gly-Glu-Gly-Gln (SEQ ID NO:12); Y is a spacer peptide of 1-7 amino acids or not present; S.sub.2 is Xaa-Lys-Xaa-Ala-Gly-Asp-Val (SEQ ID NO:13); and ii) a polypeptide for the formula Leu-Ser-Gln-Ser-Lys-Val-Gly (SEQ ID NO:4), wherein said first

polypeptide monomer is cross-linkable by a transglutaminase; and b) a second polypeptide monomer comprising a polypeptide capable of being non-enzymatically polymerized into soluble, biocompatible, bioadhesive polymers. In one aspect of the invention, Xaa, amino acid 1, of S.sub.2 is Ala or Ser. In other aspects of the invention, the spacer peptide Y is Gln-His-His-Leu-Gly (SEQ ID NO:8), Gln-His-His-Leu-Gly-Gly (SEQ ID NO:9) or His-His-Leu-Gly-Gly (SEQ ID NO:10). In yet another aspect of the invention, the spacer peptide comprises His-His-Leu-Gly (SEQ ID NO:11). Within certain aspects of the invention, at least one of Y and S.sub.2 are free of Gln residues. In other aspects of the invention, carboxyl terminal amino acid residue the polypeptide is Pro or Gly. In yet another aspect of the invention, the first polypeptide monomers are Thr-Ile-Gly-Glu-Gly-Gln-Gln-His-His-Leu-Gly-Gly-Ala-Lys-Gln-Ala-Gly-Asp-Va l (SEQ ID NO:1), Thr-Ile-Gly-Glu-Gly-Gln-Gln-His-His-Leu-Gly-Ala-Lys-Gln-Ala-Gly-Asp-Val (SEQ ID NO:2), Thr-Ile-Gly-Glu-Gly-Gln-His-His-Leu-Gly-Gly-Ala-Lys-Gln-Ala-Gly-Asp-Val (SEQ ID NO:3), or Leu-Ser-Gln-Ser-Lys-Val-Gly (SEQ ID NO:4). In one aspect of the invention, the transglutaminase is Factor XIII. Within this aspect of the invention the second polypeptide monomers of the copolymers comprise polypeptides capable of being non-enzymatically polymerized into soluble, bioadhesive, biocompatible copolymers. Such polypeptides include the formulas: Val-Pro-Gly-Val-Gly (SEQ ID NO:5), Ala-Pro-Gly-Val-Gly (SEQ ID NO:6), Gly Val Gly Val Pro (SEQ ID NO:14) and Val-Pro-Gly-Gly (SEQ ID NO:7). Within one aspect, the polymers are prepared with the ratio of first polypeptide monomers:second polypeptide monomers of 0.1-0.3:1.0, with a ratio of about 0.2:1.0 being most preferred.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 22. Document ID: US 5399665 A

L34: Entry 22 of 22 File: USPT Mar 21, 1995

DOCUMENT-IDENTIFIER: US 5399665 A
TITLE: Biodegradable polymers for cell transplantation

Other Reference Publication (77):
Nakajima; K., et al., "Adsorption of Plasma Proteins on Arg-Gly-Asp-Ser Peptide-Immobilized Poly(vinyl alcohol) and Ethylene-Acrylic Acid Copolymer Films," Polymer Journal, vol. 22, No. 11, pp. 985-990 (1990).

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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Term	Documents
POLY	338300
POLIES	67
POLYS	758
K	1582064
KS	78689
D	4354884

DS	225006
COPOLYMER	257041
COPOLYMERS	249225
LYS$	0
LYS	44956
((POLY(K WITH D) OR (COPOLYMER WITH (K OR LYS$) WITH (D OR ASP$))) WITH $4PEPTIDE).PGPB,USPT,USOC.	22

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DATE: Thursday, February 24, 2005

Hide?	Set Name	Query	Hit Count
	DB=PGPB,USPT,USOC; THES=ASSIGNEE; PLUR=YES; OP=ADJ		
☐	L21	((K or lys or arg or K) with (D or asp or glu or E)) with $4peptide with repeat$3 with consist$3	12
☐	L20	copolymer with $peptide with repeat$	52
☐	L19	((K or lys or arg or K) with (D or asp ror glu or E)) with $4peptide with repeat$3 with consist$3	4
☐	L18	(K with D) with $4peptide with repeat$3 with consist$3	2
☐	L17	19990402	41
☐	L16	(K with D) with repeat$3 with consist$3	73
☐	L15	(K with D) with peptide with repeat$3 with consist$3	2
☐	L14	(K with D) with peptide with repeat$3	16
☐	L13	(K with D) with peptide with repeat$3	16
☐	L12	(K with D) peptide with repeat$3	0
☐	L11	(RGD or KGD) peptide with repeat$3	3
☐	L10	RGD or KGD peptide with repeat$3	10165
☐	L9	19990402	22
☐	L8	((K with D) or (lys with asp)) with repeat$3 adj (unit? or motif?)	56
☐	L7	((K with D) or (lys with asp)) same repeat$3 adj (unit? or motif?)	137
☐	L6	((K with D) or (lys with asp)) same repeat$3	10456
☐	L5	5514581.pn.	1
☐	L4	19990915	0
☐	L3	(orthokeratolog$4 or ($2shap$2 with (eye? or cornea$))) and (type VI with collagen or transglutaminase)	8
☐	L2	(orthokeratolog$4 or ($2shap$2 with (eye? or cornea))) and (type VI with collagen or transglutaminase)	7
☐	L1	(orthokeratolog$4 or ($2shap$2 with (eye? or cornea))) same (type VI with collagen or transglutaminase)	0

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Search Results - Record(s) 1 through 12 of 12 returned.

☐ 1. Document ID: US 20040209818 A1

L21: Entry 1 of 12 File: PGPB Oct 21, 2004

DOCUMENT-IDENTIFIER: US 20040209818 A1
TITLE: Immunomodulating polymers

Summary of Invention Paragraph:
[0063] The invention according to another aspect is a method for treating a subject having a disorder characterized by an inappropriate IgG antibody response to specific antigen. The method includes the step of administering to a subject having a disorder characterized by an inappropriate IgG antibody a pharmaceutical preparation containing an effective amount for suppressing IgG antibody response to specific antigen of a polymer of less than 50 kilodaltons having at least two repeating charge motifs, wherein the repeating charge motif is composed of a positively charged free amino moiety and a negative charge, wherein the positively charged free amino moieties of the at least two repeating charge motifs are separated by a distance of at least 32 .ANG., wherein when the polymer is a polypeptide the polymer does not consist of lysine (K), glutamic acid (E), alanine (A), and tyrosine (Y) residues in a relative molar ratio of 3-7 parts of K to 1-3 parts of E to 4-7 parts of A, to 0.5-2 parts of Y, and wherein the subject is not preparing to undergo surgery.

Summary of Invention Paragraph:
[0065] The invention in another aspect is a method for promoting allograft survival. The method includes the step of administering to a subject in need of such treatment a pharmaceutical preparation containing an effective amount for promoting allograft survival of a polypeptide of less than 50 kilodaltons having at least two repeating charge motifs, wherein the repeating charge motif is composed of a positively charged free amino moiety and a negative charge, wherein the positively charged free amino moieties of the at least two repeating charge motifs are separated by a distance of at least 8 amino acid residues, and wherein when the polymer is a polypeptide the polymer does not consist of lysine (K), glutamic acid (E), alanine (A), and tyrosine (Y) residues in a relative molar ratio of 3-7 parts of K to 1-3 parts of E to 4-7 parts of A, to 0.5-2 parts of Y, and wherein the subject is not preparing to undergo surgery. In one embodiment the pharmaceutical preparation is administered to the subject once a day following allograft transplant. In other embodiments the at least two repeating charge motifs are separated by a distance of at least 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, or 40 amino acid residues.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

☐ 2. Document ID: US 20030143157 A1

L21: Entry 2 of 12 File: PGPB Jul 31, 2003

DOCUMENT-IDENTIFIER: US 20030143157 A1

TITLE: Method of treating tumors

Detail Description Paragraph:
[0057] Cellular immunopathology groups. Unless otherwise noted, groups consisted of 2 mice, each bearing 2 tumors, for a total of 4 tumors analyzed at each time point. The groups consisted of mice receiving no treatment (4 mice, 7 tumors); 250 .mu.g cyclo-(Arg-Gly-Asp-D-Phe-[N-Me]-V- al), given as single dose followed by sacrifice at 2 hours, 6 hours, and 1-5 days following peptide injection; RIT only (260 .mu.Ci .sup.90Y-DOTA-peptide-ChL6) followed by sacrifice at 2 hours, 6 hours, and 1-6 days (3 mice, 5 tumors at 5 days); and RIT (260 .mu.Ci .sup.90Y-DOTA-peptide-ChL6) combined with cyclo-(Arg-Gly-Asp-D-Phe-[N-Me]- -Val) (250 .mu.g) given 1 hour prior to RIT (CMRIT method), and repeated every other day through 10 days, followed by sacrifice at 2 hours, 6 hours, and 1-6 days after RIT. The tumors were removed, cut in half, frozen in optimal cutting temperature (O.C.T). medium, and stored at about -70.degree. C. until sectioning (10-.mu.m sections). All time points were evaluated for apoptosis by terminal deoxynucleotidyl transferase-mediated dUTP nick end labeling (TUNEL, Cavrieli, et al. J. Cell Bio., 119: 493-501 (1992)) analysis, and selected time points (untreated, 1,5 and 6 days) were assessed for differences in proliferation rate (Ki67) and microvessel density (CD31).

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 3. Document ID: US 20030134388 A1

L21: Entry 3 of 12 File: PGPB Jul 17, 2003

DOCUMENT-IDENTIFIER: US 20030134388 A1
TITLE: Medium additives and media for culturing animal cells

Detail Description Paragraph:
[0110] A DNA was designed to encode a polypeptide, as one example of the sericin derivative, comprising the following amino acid sequence including two repeats of the sequence (SEQ ID NO: 1) consisting of 38 amino acids which is commonly conserved in sericin: Ser-Ser-Thr-Gly-Ser-Ser-Ser-Asn-Thr-Asp-Ser-Asn-Ser-Asn-Ser-Ala-Gly-Ser-S- er-Thr-Ser-Gly-Gly-Ser-Ser-Thr-Tyr-Gly-Tyr-Ser-Ser-Asn-Ser-Arg-Asp-Gly -Ser-Val-Ser-Ser-Thr-Gly-Ser-Ser-Ser-Asn-Thr-Asp-Ser-Asn-Ser-Asn-Ser-Ala-- Gly-Ser-Ser-Thr-Ser-Gly-Gly-Ser-Ser-Thr-Tyr-Gly-Tyr-Ser-Ser-Asn-Ser -Arg-Asp-Gly-Ser-Val (SEQ ID NO: 4).

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 4. Document ID: US 20030022289 A1

L21: Entry 4 of 12 File: PGPB Jan 30, 2003

DOCUMENT-IDENTIFIER: US 20030022289 A1
TITLE: Vanilloid receptor-2

Detail Description Paragraph:
[0037] Preferred nucleic acid fragments of the invention include nucleic acid molecules

encoding one or more VR2 receptor domains. In particular embodiments, such nucleic acid fragments comprise, or alternatively consist of, nucleic acid molecules encoding: a polypeptide selected from the group consisting of: (a) N-terminal intracellular domain 1 (amino acid residues M-1 to about N-520 of SEQ ID NO: 2); (b) ankyrin repeat domain 1 (within N-terminal intracellular domain; amino acid residues from about R-288 to about C-320 of SEQ ID NO: 2); (c) ankyrin repeat domain 2 (within N-terminal intracellular domain; amino acid residues from about F-334 to about A-366 of SEQ ID NO: 2); (d) ankyrin repeat domain 3 (within N-terminal intracellular domain; (e) amino acid residues from about Q-419 to about H-449 of SEQ ID NO: 2); (f) transmembrane domain 1 (amino acid residues from about F-517 to about H-537 of SEQ ID NO: 2); (g) extracellular domain 1 (amino acid residues from about Q-538 to I-562 of SEQ ID NO: 2); (h) transmembrane domain 2 (about L-563 to about Y-578 of SEQ ID NO: 2); (i) intracellular domain 2 (amino acid residues from about F-579 to about D-592 of SEQ ID NO: 2); (j) transmembrane domain 3 (amino acid residues from about S-593 to about F-614 of SEQ ID NO: 2); (k) extracellular domain 2 (amino acid residues from about L-615 to about V-625 of SEQ ID NO: 2); (l) transmembrane domain 4 (amino acid residues from about S-626 to about I-652 of SEQ ID NO: 2); (m) intracellular domain 3 (amino acid residues from about Q-653 to about D-659 of SEQ ID NO: 2); (n) transmembrane domain 5 (amino acid residues from about L-660 to about V-679 of SEQ ID NO: 2); (o) extracellular domain 3 (amino acid residues from about S-680 to about N-7 11 of SEQ ID NO: 2); (p) pore loop (amino acid residues from about G-712 to about G-733 of SEQ ID NO: 2); (q) extracellular domain 4 (amino acid residues from about E-734 to about H-742 of SEQ ID NO: 2); (r) transmembrane domain 6 (amino acid residues from about F-743 to about S-771 of SEQ ID NO: 2); (s) C-terminal intracellular domain 4 (amino acid residues from about E-772 to about N-889 of SEQ ID NO: 2); (t) any combination of polypeptides (a)-(s); and (u) the complementary strand of the sense strand encoding any of polypeptides (a)-(s).

Detail Description Paragraph:
[0074] In additional embodiments, the polypeptide fragments of the invention comprise, or alternatively consist, of one or more VR2 receptor domains. In particular embodiments, such polypeptide fragments comprise, or alternatively, consist of: (a) N-terminal intracellular domain 1 (amino acid residues M-1 to about N-520 of SEQ ID NO: 2); (b) ankyrin repeat domain 1 (within N-terminal intracellular domain; amino acid residues from about R-288 to about C-320 of SEQ ID NO: 2); (c) ankyrin repeat domain 2 (within N-terminal intracellular domain; amino acid residues from about F-334 to about A-366 of SEQ ID NO: 2); (d) ankyrin repeat domain 3 (within N-terminal intracellular domain; (e) amino acid residues from about Q-419 to about H-449 of SEQ ID NO: 2); (f) transmembrane domain 1 (amino acid residues from about F-517 to about H-537 of SEQ ID NO: 2); (g) extracellular domain 1 (amino acid residues from about Q-538 to I-562 of SEQ ID NO: 2); (h) transmembrane domain 2 (about L-563 to about Y-578 of SEQ ID NO: 2); (i) intracellular domain 2 (amino acid residues from about F-579 to about D-592 of SEQ ID NO: 2); (j) transmembrane domain 3 (amino acid residues from about S-593 to about F-614 of SEQ ID NO: 2); (k) extracellular domain 2 (amino acid residues from about L-615 to about V-625 of SEQ ID NO: 2); (1) transmembrane domain 4 (amino acid residues from about S-626 to about I-652 of SEQ ID NO: 2); (m) intracellular domain 3 (amino acid residues from about Q-653 to about D-659 of SEQ ID NO: 2); (n) transmembrane domain 5 (amino acid residues from about L-660 to about V-679 of SEQ ID NO: 2); (o) extracellular domain 3 (amino acid residues from about S-680 to about N-711 of SEQ ID NO: 2); (p) pore loop (amino acid residues from about G-712 to about G-733 of SEQ ID NO: 2); (q) extracellular domain 4 (amino acid residues from about E-734 to about H-742 of SEQ ID NO: 2); (r) transmembrane domain 6 (amino acid residues from about F-743 to about S-771 of SEQ ID NO: 2); (s) C-terminal intracellular domain 4 (amino acid residues from about E-772 to about N-889 of SEQ ID NO: 2); or (t) any combination of polypeptides (a)-(s).

☐ 5. Document ID: US 6444440 B1

L21: Entry 5 of 12 File: USPT Sep 3, 2002

DOCUMENT-IDENTIFIER: US 6444440 B1
**** See image for Certificate of Correction ****
TITLE: Vanilloid receptor-2

Drawing Description Text (20):
Preferred nucleic acid fragments of the invention include nucleic acid molecules encoding one or more VR2 receptor domains. In particular embodiments, such nucleic acid fragments comprise, or alternatively consist of, nucleic acid molecules encoding: a polypeptide selected from the group consisting of: (a) N-terminal intracellular domain 1 (amino acid residues M-1 to about N-520 of SEQ ID NO:2); (b) ankyrin repeat domain 1 (within N-terminal intracellular domain; amino acid residues from about R-288 to about C-320 of SEQ ID NO:2); (c) ankyrin repeat domain 2 (within N-terminal intracellular domain; amino acid residues from about F-334 to about A-366 of SEQ ID NO:2); (d) ankyrin repeat domain 3 (within N-terminal intracellular domain; (e) amino acid residues from about Q-419 to about H-449 of SEQ ID NO:2); (f) transmembrane domain 1 (amino acid residues from about F-517 to about H-537 of SEQ ID NO:2); (g) extracellular domain 1 (amino acid residues from about Q-538 to I-562 of SEQ ID NO:2); (h) transmembrane domain 2 (about L-563 to about Y-578 of SEQ ID NO:2); (i) intracellular domain 2 (amino acid residues from about F-579 to about D-592 of SEQ ID NO:2); (j) transmembrane domain 3 (amino acid residues from about S-593 to about F-614 of SEQ ID NO:2); (k) extracellular domain 2 (amino acid residues from about L-615 to about V-625 of SEQ ID NO:2); (l) transmembrane domain 4 (amino acid residues from about S-626 to about 1-652 of SEQ ID NO:2); (m) intracellular domain 3 (amino acid residues from about Q-653 to about D-659 of SEQ ID NO:2); (n) transmembrane domain 5 (amino acid residues from about L-660 to about V-679 of SEQ ID NO:2); (o) extracellular domain 3 (amino acid residues from about S-680 to about N-711 of SEQ ID NO:2); (p) pore loop (amino acid residues from about G-712 to about G-733 of SEQ ID NO:2); (q) extracellular domain 4 (amino acid residues from about E-734 to about H-742 of SEQ ID NO:2); (r) transmembrane domain 6 (amino acid residues from about F-743 to about S-771 of SEQ ID NO:2); (s) C-terminal intracellular domain 4 (amino acid residues from about E-772 to about N-889 of SEQ ID NO:2); (t) any combination of polypeptides (a)-(s); and (u) the complementary strand of the sense strand encoding any of polypeptides (a)-(s).

Drawing Description Text (57):
In additional embodiments, the polypeptide fragments of the invention comprise, or alternatively consist, of one or more VR2 receptor domains. In particular embodiments, such polypeptide fragments comprise, or alternatively, consist of (a) N-terminal intracellular domain 1 (amino acid residues M-1 to about N-520 of SEQ ID NO:2); (b) ankyrin repeat domain 1 (within N-terminal intracellular domain; amino acid residues from about R-288 to about C-320 of SEQ ID NO:2); (c) ankyrin repeat domain 2 (within N-terminal intracellular domain, amino acid residues from about F-334 to about A-366 of SEQ ID NO:2); (d) ankyrin repeat domain 3 (within N-terminal intracellular domain; (e) amino acid residues from about Q-419 to about H-449 of SEQ ID NO:2); (f) transmembrane domain 1 (amino acid residues from about F-517 to about H-537 of SEQ ID NO:2); (g) extracellular domain 1 (amino acid residues from about Q-538 to I562 of SEQ ID NO:2); (h) transmembrane domain 2 (about L-563 to about Y-578 of SEQ ID NO:2); (i) intracellular domain 2 (amino acid residues from about F-579 to about D-592 of SEQ ID NO:2); (n) transmembrane domain 3 (amino acid residues from about S-593 to about F-614 of SEQ ID NO:2); (k) extracellular domain 2 (amino acid residues from about L-615 to about V-625 of SEQ ID NO:2); (1) transmembrane domain 4 (amino acid residues from about S-626 to about I652 of SEQ ID NO:2); (m) intracellular domain 3 (amino acid residues from about Q-653 to about D-659 of SEQ ID NO:2); (n) transmembrane domain 5 (amino acid residues from about L-660 to about V-679 of SEQ ID NO:2); (o) extracellular domain 3 (amino acid residues from about S-680 to about N-711 of SEQ ID NO:2); (p) pore loop (amino acid residues from about G-712 to about G-733 of SEQ ID NO:2); (q) extracellular domain 4 (amino acid residues from about E-734 to about H-742 of SEQ ID NO:2); (r) transmembrane domain 6 (amino acid residues from about F-743 to about S-771 of SEQ ID NO:2); (s) C-terminal intracellular domain 4 (amino acid residues from about E-772 to about N-889 of SEQ ID NO:2); or (t) any combination of polypeptides (a)-(s).

6. Document ID: US 6399062 B1

L21: Entry 6 of 12 File: USPT Jun 4, 2002

DOCUMENT-IDENTIFIER: US 6399062 B1
TITLE: Murine monoclonal antibody protective against Plasmodium vivax malaria

Brief Summary Text (28):
In U.S. Pat. No. 4,957,869, Arnot et al. describes an immunogenic peptide corresponding to P. vivax CS protein consisting of at least two repeats of the amino acid sequence Asp-Arg-Ala-X-Gly-Gln-Pro-Ala-Gly. X is defined as selected from the group consisting of Asp and Ala. The prior art approachs the problem from the premise that a vaccine is needed to provide protection against malaria. There is also a need for a simple material to protect against P. vivax.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWMC | Draw Desc | Image

7. Document ID: US 6124429 A

L21: Entry 7 of 12 File: USPT Sep 26, 2000

DOCUMENT-IDENTIFIER: US 6124429 A
TITLE: Genetically engineered alpha helix polypeptide

Detailed Description Text (3):
Referring to FIG. 1, for example, the polypeptide has an amino acid sequence of Leu-Glu-Thr-Leu-Ala-Lys-Ala-Leu-Glu-Thr-Leu-Ala-Lys-Ala-Leu-Glu-Thr-Leu-Al a-Lys-Ala-Leu-Glu-Thr-Leu-Ala-Lys-Ala-Leu-Glu-Thr-Leu-Ala-Lys-Ala which contains 4 repeats of a sequence consisting of 7 amino acid residues, and the Leu residues (in SEQ ID NO. 5 following the initial Met residue) of 1st, 8th, 15th and 22nd residues in the sequence are arranged such that they are placed on the same side of the .alpha.-helix. Thus, the .alpha.-helix has a hydrophobic surface and a hydrophilic surface in the side surface thereof thereby forming stable .alpha.-helix structure.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWMC | Draw Desc | Image

8. Document ID: US 5700906 A

L21: Entry 8 of 12 File: USPT Dec 23, 1997

DOCUMENT-IDENTIFIER: US 5700906 A
TITLE: Immunogenic peptide antigen corresponding to plasmodium vivax circumsporozoite protein

CLAIMS:

1. A peptide having an amino acid sequence consisting of the sequence Asp-Arg-Ala-X-Gly-Gln-

Pro-Ala-Gly repeated from 2 to 18 or more than 19 times wherein X is independently selected from the group consisting of Asp and Ala, said peptide being man-made and isolated form and having the property of eliciting antibodies that recognize the circumsporozoite protein of Plasmodium vivax, provided that the peptide is not said circumsporozoite protein.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Drawi Desc | Image

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☐ 9. Document ID: US 5225530 A

L21: Entry 9 of 12 File: USPT Jul 6, 1993

DOCUMENT-IDENTIFIER: US 5225530 A
TITLE: Polypeptide useful for the preparation of antimalarial vaccines and of diagnostic kits for the detection of malarial affections

CLAIMS:

1. A polypeptide useful for the preparation of antimalarial vaccines and of diagnostic kits for the detection of antisporozoite antibodies in clinical samples, which consists essentially of a synthetic peptide repeating Region I of the circumsporozoitic protein of Plasmodium falciparum and units of a repeating tetrapeptide of the circumsporozoitic protein of Plasmodium falciparum, linked by an amidic bond between the tail proline of n I of the peptide and the head asparagine of the first tetrapeptide of the repeating tetrapeptide units, the polypeptide having the formula: Lys-Pro-Lys-His-Lys-Lys-Leu-Lys-Gln-Pro-Gly-Asp-Gly-Asn-Pro-(Asn-Ala-Asn-Pro).sub.n -Asn-Ala wherein n is from 3 to 40.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Drawi Desc | Image

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☐ 10. Document ID: US 5116755 A

L21: Entry 10 of 12 File: USPT May 26, 1992

DOCUMENT-IDENTIFIER: US 5116755 A
TITLE: Asexual blood stage antigens of Plasmodium falciparum which encode a rhoptry protein

Detailed Description Text (38):
The sequence of Ag189 from position 1 to 834 encodes predominantly hydrophilic amino acids. At the 3' end starting at position 835 extends a highly charged region which consists of 10 dipeptide repeats (Glu-Lys) and 6 interspersed tripeptide repeats (Glu-Glu-Lys). The repeat-block is flanked on either side by three glutamic acids.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Drawi Desc | Image

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☐ 11. Document ID: US 4957869 A

L21: Entry 11 of 12 File: USPT Sep 18, 1990

DOCUMENT-IDENTIFIER: US 4957869 A
TITLE: Immunogenic peptide corresponding to P. vivax CS protein

CLAIMS:

1. DNA encoding an immunogenic peptide said peptide comprising the amino acid sequence Asp-Arg-Ala-X-Gly-Gln-Pro-Ala-Gly repeated at least twice wherein X is independently selected from the group consisting of Asp and Ala, said peptide having the property of eliciting formation of antibodies that recognize the immunodominant epitope of the P. vivax circumsporozoite surface protein on the surface of sporozoites, said DNA being essentially purified; provided that said peptide is not said surface protein.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

☐ 12. Document ID: US 4898926 A

L21: Entry 12 of 12 File: USPT Feb 6, 1990

DOCUMENT-IDENTIFIER: US 4898926 A
TITLE: Bioelastomer containing tetra/penta-peptide units

Abstract Text (2):
wherein P is a peptide-forming residue of L-proline; G is a peptide-forming residue of glycine; .alpha. is a peptide-forming residue of L-valine or an ionizable peptide-forming residue selected from the group consisting of residues of L-Glu, L-Asp, L-His, L-Lys and L-Tyr; .rho. is a peptide-forming residue of glycine or a peptide-forming residue of D-Glu, D-Asp, D-His, D-Lys and D-Tyr; and .OMEGA. is a peptide-forming residue of L-valine or an ionizable peptide-forming residue selected from the group consisting of residues of L-Glu, L-Asp, L-His, L-Lys and L-Tyr; and wherein n is an integer of from 1 to 5,000; with the proviso that in at least one repeating pentapeptide unit of said bioelastomer, at least one of said .alpha. or .OMEGA. is a peptide-forming residue selected from the group consisting of residues of L-Glu, L-Asp, L-His, L-Lys and L-Tyr, or .rho. is a peptide-forming residue selected from the group consisting of residues of D-Glu, D-Asp, D-His, D-Lys and D-Tyr.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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Term	Documents
K	1582064
KS	78689

LYS	48043
LY	843371
LIES	548735
ARG	51311
ARGS	739
D	4354884
DS	225006
ASP	56020
ASPS	1473
(((K OR LYS OR ARG OR K) WITH (D OR ASP OR GLU OR E)) WITH $4PEPTIDE WITH REPEAT$3 WITH CONSIST$3).PGPB,USPT,USOC.	12

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☐ 1. Document ID: US 20050014206 A1

L13: Entry 1 of 16 File: PGPB Jan 20, 2005

DOCUMENT-IDENTIFIER: US 20050014206 A1
TITLE: Method of identifying compounds that specifically inhibit the anaphase promoting complex

Summary of Invention Paragraph:
[0007] APC is an unusually complex ubiquitin ligase, sedimenting with an S value of 22 and being comprised of at least 11 core subunits. Sequence motifs found in APC subunits include tetratrico peptide repeats (TPR) in APC3/CDC27, APC6/CDC16, APC7, and APC8/CDC23 (Lamb, J. R., et al, Embo J 13:4321-8 (1994); Blatch, G. L. and Lassle, M., Bioessays 21:932-9 (1999)), the DOC domain in APC10/DOC1 (Kominami, K., et al., Embo J 17:5388-99 (1998); Grossberger, R., et al., J Biol Chem 274:14500-7 (1999)), a cullin homology domain in APC2 (Zachariae, W., et al., Science 279:1216-9 (1998); Yu, H., et al., Science 279:1219-22 (1998)), and a RING finger in APC11 (Gmachl, M., et al., Proc Natl Acad Sci USA 97:8973-8 (2000); Leverson, J. D. et al., Mol Biol Cell 11:2315-25 (2000)). Like several other RING finger proteins, APC11 alone is sufficient to catalyze polyubiquitination reactions, although with reduced substrate specificity and regulation (Gmachl, M., et al., Proc Natl Acad Sci USA 97:8973-8 (2000); Leverson, J. D. et al., Mol Biol Cell 11:2315-25 (2000)). Furthermore, APC11 tightly interacts with APC2's cullin domain (Tang, Z. et al., Mol Biol Cell 12:3839-51 (2001); Ohta, T., et al., Mol Cell 3:535-41 (1999)). Similar pairs of cullin and RING proteins are also found at the core of SCF and VHL complex-type ubiquitin ligases, where they form the minimal catalytically active module. These observations imply that APC2 and APC11 constitute the active ubiquitin-conjugating component within holo-APC (the naturally occuring APC), whereas other subunits might confer substrate specificity or play roles in regulation. Alternatively, their main function might be a structural one, as suggested by a 3D model of human APC reconstituted from cryo-electron microscopy. This model shows a cage-like structure that might shield the active subunits on the inside of a reaction chamber (Gieffers, C., et al., Mol Cell 7:907-13 (2001)).

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

☐ 2. Document ID: US 20040234609 A1

L13: Entry 2 of 16 File: PGPB Nov 25, 2004

DOCUMENT-IDENTIFIER: US 20040234609 A1
TITLE: Repeat sequence protein polymer active agent congjugates, methods and uses

Detail Description Paragraph:
[0036] Additionally, the protein polymer may have amino acid sequences that link the repeating A, A', and A" units or amino acid sequences that link between the individual A, A' or A" units. These linking sequences are typically from 1 to 10 amino acids and serve to link the repeating

units. These repeat polymers can be synthesized by generally recognized methods of chemical synthesis (for example, L. Andersson et al., Large-scale synthesis of peptides, Biopolymers 55 (3), 227-50 (2000)), genetic manipulation (for example, J. Cappello, Genetically Engineered Protein Polymers, Handbook of Biodegradable Polymers, Domb, A. J.; Kost, J.; Wiseman, D. (Eds.), Harvard Academic Publishers, Amsterdam; pages 387-414), and enzymatic synthesis (for example, C. H. Wong & K. T. Wang, New Developments in Enzymatic Peptide Synthesis, Experientia 47(11-12), 1123-9 (1991)). For example, the repeat sequence protein polymers of the present invention may be synthesized using the methods described in U.S. Pat. Nos. 5,243,038 and 6,355,776, the disclosures of which are incorporated by reference herein. In another example, the repeat sequence protein polymers can by synthesized utilizing non-ribosomal peptide synthase (for example, H. V. Dohren, et al., Multifunctional Peptide Synthase, Chem. Rev 97, 2675-2705(1997).

☐ 3. Document ID: US 20040228913 A1

L13: Entry 3 of 16 File: PGPB Nov 18, 2004

DOCUMENT-IDENTIFIER: US 20040228913 A1
TITLE: Controlled release of active agents utilizing repeat sequence protein polymers

Detail Description Paragraph:
[0030] Additionally, the protein polymer may have amino acid sequences that link the repeating A, A', and A" units or amino acid sequences that link between the individual A, A' or A" units. These linking sequences are typically from 1 to 10 amino acids and serve to link the repeating units. These repeat polymers can be synthesized by generally recognized methods of chemical synthesis (For example, L. Andersson et. al., Large-scale synthesis of peptides, Biopolymers 55 (3), 227-50 (2000)), genetic manipulation (For example, J. Cappello, Genetically Engineered Protein Polymers, Handbook of Biodegradable Polymers, Domb, A. J.; Kost, J.; Wiseman, D. (Eds.), Harvard Academic Publishers, Amsterdam; pages 387-414), and enzymatic synthesis (For example, C. H. Wong & K. T. Wang, New Developments in Enzymatic Peptide Synthesis, Experientia 47(11-12), 1123-9 (1991)). For example, the repeat sequence protein polymers of the present invention may be synthesized using the methods described in U.S. Pat. Nos. 5,243,038 and 6,355,776, the disclosures of which are incorporated by reference herein. In another example, the repeat sequence protein polymers can by synthesized utilizing non-ribosomal peptide synthase (for example, H. V. Dohren, et al., Multifunctional Peptide Synthase, Chem.Rev 97, 2675-2705(1997). The repeat sequence protein polymers may be produced on a commercial scale.

☐ 4. Document ID: US 20040219160 A1

L13: Entry 4 of 16 File: PGPB Nov 4, 2004

DOCUMENT-IDENTIFIER: US 20040219160 A1
TITLE: Zwitterionic immunomodulators for the treatment of asthma and allergy

Detail Description Paragraph:

[0244] (K-D).sub.n peptides consisting of 15, 20, or 25 repeating units each stimulated T cell activation in vitro. The response was less with peptides of 10 repeats. Peptides consisting of less than 10 repeating units (1 and 5 repeats) did not stimulate T cell activation. A control peptide, poly-L-lysine, also did not stimulate T cell proliferation. These data clearly indicate that zwitterionic repeating unit polymers other than polysaccharides stimulate T cell activation and that this activity depends on the repeating unit size of the polymer.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 5. Document ID: US 20040209818 A1

L13: Entry 5 of 16 File: PGPB Oct 21, 2004

DOCUMENT-IDENTIFIER: US 20040209818 A1
TITLE: Immunomodulating polymers

Detail Description Paragraph:
[0174] K-D peptides consisting of 15, 20 or 25 repeating units each stimulated T cell activation in vitro (FIG. 6). The response was less in peptides of 10 repeats. Peptides consisting of less than 10 repeating units (1 and 5 repeats) did not stimulate T cell activation. A control peptide, poly-L-lysine, also did not stimulate T cell proliferation. These data clearly indicate that zwitterionic repeating unit polymers other than polysaccharides stimulate T cell activation and that this activity depends on the repeating unit size of the polymer.

Detail Description Paragraph:
[0175] This example addresses whether zwitterionic (K-D).sub.n peptides could protect animals against abscess formation in vivo, using the abdominal sepsis model in Example 1. Animals were administered 50 or 5 .mu.g of the 25 repeating unit K-D peptide (K-D).sub.25 and challenged with B. fragilis. The results are shown in Table 1, Experiment A. Treatment with the higher dose of (K-D).sub.25 yielded significant protection in animals compared with the saline-treated control group (17% compared with 78%, respectively, $p<0.0005$). However, treatment with the lower dose of the peptide failed to protect. The zwitterionic polysaccharide S. pneumoniae type 1 CP yielded significant protection of animals at the 50 .mu.g dose, but not at the 5 .mu.g dose. Administration of poly-L-lysine at the higher dose did not protect against abscess formation. Finally, treatment of animals with (K-D).sub.25 protected animals against intraabdominal abscess formation by the important pathogen S. aureus (Table 1, Experiment B). Animals treated with saline and challenged with S. aureus had an 80% abscess rate, while treatment with 50 .mu.g of (K-D).sub.25 reduced abscess formation to 20% ($p<0.02$). These data correlate with our previous studies demonstrating that treatment of animals with PS A prevents abscesses induced by a broad range of intestinal organisms commonly associated with intraabdominal sepsis in humans. Tzianabos, A O et al. J Clin Invest 96:2727 (1995).

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 6. Document ID: US 20040180027 A1

L13: Entry 6 of 16 File: PGPB Sep 16, 2004

DOCUMENT-IDENTIFIER: US 20040180027 A1

TITLE: Use of repeat sequence protein polymers in personal care compositions

Detail Description Paragraph:
[0033] One skilled in the art will appreciate the various methods for producing the repeat sequence protein polymers of the present invention, any of which may be employed herein. For example, the repeat sequence protein polymer may be produced by generally recognized methods of chemical synthesis, for example, L Andersson et. al., Large-scale synthesis of peptides, Biopolymers 55(3), 227-50 (2000)); genetic manipulation (for example, J. Cappello, Genetically Engineered Protein Polymers, Handbook of Biodegradable Polymers, Domb, A. J.; Kost, J.; Wiseman, D. (Eds.), Harvard Academic Publishers, Amsterdam; pages 387-414); and enzymatic synthesis (for example, C. H. Wong & K. T. Wang, New Developments in Enzymatic Peptide Synthesis, Experientia 47(11-12), 1123-9 (1991)). For example, the repeat sequence protein polymers of the present invention may be produced using the methods described in U.S. Pat. Nos. 5,243,038 and 6,355,776, the disclosures of which are incorporated by reference herein. In another example, the repeat sequence protein polymers may be produced utilizing non-ribosomal peptide synthase (for example, H. V. Dohren, et al., Multifunctional Peptide Synthase, Chem.Rev. 97, 2675-2705(1997). The repeat sequence protein polymers may also be produced on a commercial scale.

☐ 7. Document ID: US 20040133357 A1

L13: Entry 7 of 16 File: PGPB Jul 8, 2004

DOCUMENT-IDENTIFIER: US 20040133357 A1
TITLE: Humanized antibodies against vascular endothelial growth factor

Detail Description Paragraph:
[0341] In a particular embodiment, the method comprises the steps of: a) providing an amino acid sequence of the variable region of the heavy chain (V.sub.H) or light chain (V.sub.L) of a lead antibody, the lead antibody having a known three dimensional structure; b) identifying the amino acid sequences in the CDRs of the lead antibody; c) selecting one of the CDRs in the V.sub.H or V.sub.L region of the lead antibody; d) providing an amino acid sequence that comprises at least 3 consecutive amino acid residues in the selected CDR, the selected amino acid sequence being defined as a lead sequence; e) comparing the lead sequence with a plurality of tester protein sequences; f) selecting from the plurality of tester protein sequences at least two peptide segments that have at least 10% sequence identity with lead sequence, the selected peptide segments forming a hit library; g) building an amino acid positional variant profile of the hit library based on frequency of amino acid variant appearing at each position of the lead sequence; h) combining the amino acid variants in the hit library to produce a combination of hit variants which form a hit variant library; I) determining if a member of the hit variant library is structurally compatible with the lead structural template using a scoring function; j) selecting the members of the hit variant library that score equal to or better than the lead sequence; k) constructing a degenerate nucleic acid library comprising DNA segments encoding the amino acid sequences of the selected members of the hit variant library; 1) determining the diversity of the nucleic acid library, if the diversity is higher than 1.times.10.sup.6, repeating steps j) through l) until the diversity of the diversity of the nucleic acid library is equal to or lower than 1.times.10.sup.6; m) introducing the DNA segments in the degenerate nucleic acid library into cells of a host organism; n) expressing the DNA segments in the host cells such that recombinant antibodies containing the amino acid sequences of the hit library are produced in the cells of the host organism; o) selecting the recombinant antibody that binds to a target antigen with affinity higher than 10.sup.6 M.sup.-1; and p) repeating steps e) through o) if no recombinant antibody is found to bind to the

target antigen with affinity higher than 10.sup.6 M.sup.1.

Detail Description Paragraph:
[0342] In another particular embodiment, the method comprises the steps of: a) providing an amino acid sequence of the variable region of the heavy chain (V.sub.H) or light chain (V.sub.L) of a lead antibody, the lead antibody having a known three dimensional structure which is defined as a lead structural template; b) identifying the amino acid sequences in the CDRs of the lead antibody; c) selecting one of the CDRs in the V.sub.H or V.sub.L region of the lead antibody; d) providing an amino acid sequence that comprises at least 3 consecutive amino acid residues in the selected CDR, the selected amino acid sequence being defined as a lead sequence; e) mutating the lead sequence by substituting one or more of the amino acid residues of the lead sequence with one or more different amino acid residues, resulting in a lead sequence mutant library; f) determining if a member of the lead sequence mutant library is structurally compatible with the lead structural template using a first scoring function; g) selecting the lead sequence mutants that score equal to or better than the lead sequence; h) comparing the lead sequence with a plurality of tester protein sequences; I) selecting from the plurality of tester protein sequences at least two peptide segments that have at least 10% sequence identity with lead sequence, the selected peptide segments forming a hit library; j) building an amino acid positional variant profile of the hit library based on frequency of amino acid variant appearing at each position of the lead sequence; k) combining the amino acid variants in the hit library to produce a combination of hit variants; l) combining the selected lead sequence mutants with the combination of hit variants to produce a hit variant library; m) determining if a member of the hit variant library is structurally compatible with the lead structural template using a second scoring function; n) selecting the members of the hit variant library that score equal to or better than the lead sequence; o) constructing a degenerate nucleic acid library comprising DNA segments encoding the amino acid sequences of the selected members of the hit variant library; p) determining the diversity of the nucleic acid library, and if the diversity is higher than 1.times.10.sup.6, repeating steps n) through p) until the diversity of the diversity of the nucleic acid library is equal to or lower than 1.times.10.sup.6; q) introducing the DNA segments in the degenerate nucleic acid library into cells of a host organism; r) expressing the DNA segments in the host cells such that recombinant antibodies containing the amino acid sequences of the hit library are produced in the cells of the host organism; s) selecting the recombinant antibody that binds to a target antigen with affinity higher than 10.sup.6 M.sup.-1; and t) repeating steps e) through s) if no recombinant antibody is found to bind to the target antigen with affinity higher than 10.sup.6 M.sup.-1.

☐ 8. Document ID: US 20040009897 A1

L13: Entry 8 of 16 File: PGPB Jan 15, 2004

DOCUMENT-IDENTIFIER: US 20040009897 A1
TITLE: Stabilized synthetic immunogen delivery system

CLAIMS:

1. A stabilized immunostimulatory complex comprising a cationic peptide immunogen and anionic CpG oligonucleotide wherein the cationic peptide immunogen has a net positive charge at a pH in the range of 5.0 to 8.0 calculated by assigning a +1 charge for each lysine (K), arginine (R) or histidine (H), a -1 charge for each aspartic acid (D) or glutamic acid (E) and a charge of 0 for all other amino acids in the peptide immunogen and wherein the anionic CpG oligonucleotide has a net negative charge at a pH in the range of 5.0-8.0 and is a single-stranded DNA comprising 8 to 64 nucleotide bases with a repeat of a cytosine-guanidine motif and the number

of repeats of the CpG motif is in the range of 1 to 10.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 9. Document ID: US 20030165478 A1

L13: Entry 9 of 16 File: PGPB Sep 4, 2003

DOCUMENT-IDENTIFIER: US 20030165478 A1
TITLE: Stabilized synthetic immunogen delivery system

CLAIMS:

1. A stabilized immunostimulatory complex comprising a cationic peptide immunogen and anionic CpG oligonucleotide wherein the cationic peptide immunogen has a net positive charge at a pH in the range of 5.0 to 8.0 calculated by assigning a +1 charge for each lysine (K), arginine (R) or histidine (H), a -1 charge for each aspartic acid (D) or glutamic acid (E) and a charge of 0 for all other amino acids in the peptide immunogen and wherein the anionic CpG oligonucleotide has a net negative charge at a pH in the range of 5.0-8.0 and is a single-stranded DNA comprising 8 to 64 nucleotide bases with a repeat of a cytosine-guanidine motif and the number of repeats of the CpG motif is in the range of 1 to 10.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 10. Document ID: US 6642365 B1

L13: Entry 10 of 16 File: USPT Nov 4, 2003

DOCUMENT-IDENTIFIER: US 6642365 B1
TITLE: Anti-(retro)viral conjugates of saccharides and acetamidino or guanidino compounds

Brief Summary Text (6):
HIV: human immunodeficiency virus; RT: reverse transcriptase; RNAse: ribonuclease; UC781: a non-nucleoside RT inhibitor; AZT: azidothymidine; KS: Kaposi sarcoma; AIDS: acquired immunodeficiency syndrome; Tat: trans-activator of transcription; TAR: trans-activation responsive RNA region; LTR: long terminal repeat; P-TEFb: positive transcription elongation factor b; CDK9: cyclin-dependent kinase; ALX40-4C: D-arginine nonapeptide; CGP64222: peptide peptoid mimetic of Tat basic domain; HeLa: human epithelial cell line derived from cervical cancer; CXCR4: CXC (.alpha.-chemotactic cytokines related to interleukin-8, containing C-X-C motif in their sequence, e.g. SDF-1.alpha.) chemokine receptor 4; CD4: cluster of differentiation 4 (characteristic receptor of T-helper cells); CCR5: CC (.beta.-chemotactic cytokines, containing CC motif in their sequence) chemokine receptor 5; PBMC: peripheral blood mononuclear cells; T22: octadeca peptide, CXCR4 antagonist; AAC: aminoglycoside-arginine conjugates; R52: Tat-derived model undeca peptide, containing a single arginine moiety at position 52 of native Tat protein, in the strand of lysines; R4K: tetra-argininamido kanamycin

A conjugate; R3G: tri-argininamido gentamicin C conjugate; MMP: .alpha.-methyl D-mannopyranoside RMMP: mono-argininamido MMP conjugate; R4GC1a: tetra-argininamido gentamicin C1a isomer conjugate; GABA: .gamma.-aminobutyric acid; GB4K: tetra-.gamma.-(N-guanidino) butyramido-kanamycin A conjugate; NeoR: hexa-argininamido neomycin B conjugate; EIAV: equine infectious anemia virus; ED: equine dermal fibroblasts; DMF: dimethyl formamide; DCC: dicyclohexyl carbodiimide; M.p.: melting point; Pd/C: palladium on charcoal catalyst; TFA: trifluoro acetic acid; FABHRMS: fast atom bombardment high resolution mass spectroscopy; HSQC: heteronuclear single-quantum coherence; TOCSY: total correlation spectroscopy; RRE: Rev responsive RNA element; CAT: chloramphenicol acetyl transferase; DTT: dithiotreitol; EDTA: ethylenediamine tetraacetic acid; CI.sub.50 : concentration of compound, that causes 50% inhibition of Tat-TAR interaction; CE.sub.50 : concentration of 50% elution from affinity column; CD.sub.50 : 50% binding concentration, related to K.sub.d ; K.sub.d : dissociation constant; LAN-1: human neurioblastoma cell line; MPC-11: murine plasmocytoma cell line; MT-2, MT-4: human T-lymphoma cell lines, transfected with HTLV-I; HTLV-I, HTLV-II: Human-T-lymphoma virus type I or II; DMEM: Dulbecco modified Eagle's medium; FCS: fetal calf serum; polybrene: hexadimetrine bromide; pfu: plaque forming unit; ELISA: enzyme-linked immuno sorption assay; P4-CCR5 MAGI: human cell line of monocyte/macrophages origin; HUVEC: human umbilical vascular endothelial cells; SUP-T1: human T-cell line; cpe: cytopathic effect; IC.sub.50 : 50% inhibitory concentration; CC.sub.50 : 50% cytotoxic concentration; EC.sub.50 : 50% effective concentration; TI.sub.50 : 50% in vitro therapeutic index (ratio CC.sub.50 /EC.sub.50); SDS: sodium dodecyl sulfate; PAGE: polyacrylamide gel-electrophoresis; TLC: thin layer chromatography; HRP: horseradish peroxidase; SDF-1.alpha.: stromal cell derived factor 1, subtype .alpha., the natural ligand of CXCR4; IL2: interleukin 2; IgG: immunoglobulin G; mAb: monoclonal antibody; 12G5: anti-CXCR4 mAb; 2D7: anti-CCR5 mAb; Leu3a: anti-CD4 mAb; PE: phycoerythrin; FITC: fluorescein isothiocyanate; RANTES: regulated on activation normal T-cell expressed and secreted chemokine; MPD: methyl pentandiol; SIR: single isomorphus replacement; SIRA: single anomalous replacement; MAD: multiple anomalous diffraction.

☐ 11. Document ID: US 6383775 B1

L13: Entry 11 of 16 File: USPT May 7, 2002

DOCUMENT-IDENTIFIER: US 6383775 B1
TITLE: Designer proteases

Detailed Description Text (111):
b) Positive Selection: This makes use of a construct as exemplified in FIG. 5C. Such a construct is obtained by substituting the natural cleavage site (AP1 and AP2, FIG. 5) with a cassette or DNA fragment encoding the desired new target sequence upstream of a region encoding an affinity tag. The affinity tag is a protein sequence (e.g., myc tag) able to bind to an immoblised ligand such as a cognate antibody (reference for myc/9E10: Fowlkes, D. M., Adams, M. D., Fowler, V. A., Kay, B. K. (1992) Multipurpose Vectors For Peptide Expression On The M13 Viral Surface Biotechniques 13(3):422) or a small molecule ligand such as nickel bound to a chelating insoluble matrix (in this case the tag is made up of repeating histidine residues). The construct is produced so that the protease domain, target, tag and exporter are all fused to maintain reading frame, thus producing a fusion protein that will translocate the protease domain to the outer surface of the bacterium. The affinity tag will be sterically masked (non-functional) by the large globular protease domain (FIG. 6A). However, upon mutagenesis of the protease-encoding domain (as above) the resultant mutant library will contain four types of constructs. Cells expressing a protease able to cleave a site on the amino terminus side of the tag sequence will secrete soluble protease into the media and leave unmasked (functional) affinity tag (FIG. 6B). In contrast, mutants cleaving downstream of (or within) the affinity tag will produce cells lacking the tag (FIG. 6C). Most mutations will not alter protease

specificity and so most cells we be functionally wild type (FIG. 6D) and some will fail to express any protein on the surface (FIG. 6E). Only cells of type shown in FIG. 6B will be able to stick to immobilised ligand. This forms the basis of a positive selection protocol in which pools of each library are subjected to affinity chromatography or biopanning. Cells retained by the affinity matrix (e.g., ligand covalently attached to agarose or magnetic particles) would then be washed with sterile media, allowed to grow and reapplied to the fresh affinity media in an iterative manner. Thus, enrichment for cells carrying engineered protease directed against the desired target region would be obtained.

☐ 12. Document ID: US 6174528 B1

L13: Entry 12 of 16 File: USPT Jan 16, 2001

DOCUMENT-IDENTIFIER: US 6174528 B1
TITLE: Synthetic peptides and vaccines comprising same

Detailed Description Text (75):
A model .alpha.-helical coiled coil peptide based on the structure of a peptide corresponding to the GCN4 leucine zipper (O'Shea et al 1989, 1991) was designed. This peptide has a seven residue leucine repeat (in the d position) and a consensus valine (in the a position). The first heptad contains the sequence: M K Q L E D K [SEQ ID NO:3] which includes several of the features found in a stable coiled-coil heptad repeat. These include an acid/base pair (glu/lys) at positions e and g, and polar groups in positions b, c, f. A model heptad repeat was derived from the consensus features of the GCN4 leucine zipper peptide: V K Q L E D K [SEQ ID NO:3], which when repeated would give a model peptide, (V K Q L E D K).sub.n, with the potential to form a .alpha.-helical coiled coil. Overlapping fragments of a conformational epitope under study can be embedded within the model coiled coil peptide to give a chimeric peptide.

☐ 13. Document ID: US 5609872 A

L13: Entry 13 of 16 File: USPT Mar 11, 1997

DOCUMENT-IDENTIFIER: US 5609872 A
TITLE: Peptides comprising a protective epitope from blood stages of plasmodium falciparum

Brief Summary Text (9):
The mAb 33G2 was initially selected due to its reactivity with Pf155/RESA as detected by erythrocyte membrane immunofluorescence (EMIF) and immunoblotting (Udomsangpetch, R., Lundgren, K., Berzins, K., W ahlin, B., Perlmann, H., Troye-Blomberg, M., Carlsson, J., Wahlgren, M., Perlmann, P. and Bj orkman, A. (1986) Human monoclonal antibodies to Pf155, a major antigen of malaria parasite Plasmodium falciparum. Science 231, 57-59) but subsequent analyses with recombinant fusion proteins and synthetic peptides revealed that the antibody showed reactivity with a family of cross-reacting P.falciparum blood-stage antigens, including Pf155/RESA, Pf11.1 and Ag332 (Mattei, D., Berzins, K., Wahlgren, M., Udomsangpetch, R., Perlmann, P., Griesser, H. W., Scherf, A., M uller-Hill, B., Bonnefoy, S., Guilotte, M., Langsley, G., Pereira da Silva,

L. and Mercereau-Puijalon, O. (1989) Cross-reactive antigenic determinants present on different Plasmodium falciparum blood-stage antigens. Parasite Immunol. 11, 15-30; Mercereau-Puijalon, O., Langsley, G., Mattei, D., Guilotte, M., Blisnick, T., Berzins, K., Griesser, H. W., Scherf, A., M uller-Hill, B. and Pereira da Silva, L. (1987) Presence of cross-reacting determinants on several blood-stage antigens of Plasmodium falciparum. UCLA Symp.Molec. Cell.Biol. 42, 343354; Udomsangpetch, R., Carlsson, J., W ahlin, B., Holmquist, G., Ozaki, L. S., Scherf, A., Mattei, D., Mercereau-Puijalon, O., Uni, S., Aikawa, M., Perzins, K. and Perlmann, P. (1989) Reactivity of the human monoclonal antibody 33G2 with repeated sequences of three distinct Plasmodium falciparum antigens. J. Immunol. 142, 3620-3626). A feature shared between these antigens is their contents of several tandemly repeated amino acid sequences containing regularly spaced pairs of glutamic acid (Mattei, D., Berzins, K., Wahlgren, M., Udomsangpetch, R., Perlmann, P., Griesser, H. W., Scherf, A., M uller-Hill, B., Bonnefoy, S., Guillotte, M., Langsley, G., Pereira da Silva, L. and Mercereau-Puijalon, O. (1989) Cross-reactive antigenic determinants present on different Plasmodium falciparum blood-stage antigens. Parasite Immunol. 11, 15-30; Favaloro, J. M., Coppel, R. L., Corcoran, L. M., Foote, S. J., Brown, G. V., Anders, R. F. and Kemp, D. J. (1986) Structure of the RESA gene of Plasmodium falciparum. Nucleic Acids Res. 14, 8265-8277; Scherf, A., Hilbich, C., Sieg, K., Mattei, D., Mercereau-Puijalon, O. and M uller-Hill, B. (1988) The 11-1 gene of Plasmodium falciparum codes for distinct fast evolving repeats. EMBO J. 7, 1129-1137). These dimers of glutamic acid were suggested to be the structures responsible for the antigenic cross-reactions seen between the three antigens (Mattei, D., Berzins, K., Wahlgren, M., Udomsangpetch, R., Perlmann, P., Griesser, H. W., Scherf, A., M uller-Hill, B., Bonnefoy, S., Guilotte, M., Langsley, G., Pereira da Silva, L. and Mercereau-Puijalon, O. (1989) Cross-reactive antigenic determinants present on different Plasmodium falciparum blood-stage antigens. Parasite Immunol. 11, 15-30; Merecereau-Puijalon, O., Langsley, G., Mattei, D., Guilotte, M., Blisnick, T., Berzins, K., Griesser, H. W., Scherf, A., M uller-Hill, B. and Pereira da Silva, L. (1987) Presence of cross-reacting determinants on several blood-stage antigens of Plasmodium falciparum. UCLA Symp.Molec. Cell.Biol. 42, 343-354; Udomsangpetch, R., Carlsson, J., W ahlin, B., Holmquist, G., Ozaki, L. S., Scherf, A., Mattei, D., Mercereau-Puijalon, O., Uni, S., Aikawa, M., Berzins, K. and Perlmann, P. (1989) Reactivity of the human monoclonal antibody 33G2 with repeated sequences of three distinct Plasmodium falciparum antigens. J. Immunol. 142, 3620-3626). Inhibition with synthetic peptides of the mAb 33G2 binding in EMIF showed that peptides corresponding to Ag332 repeat sequences were the most efficient inhibitors, suggesting that Ag332 was the original target for the antibody (Udomsangpetch, R., Carlsson, J., W ahlin, B., Holmquist, G., Ozaki, L. S., Scharf, A., Mattei, D., Mercereau-Puijalon, O., Uni, S., Aikawa, M., Berzins, K. and Perlmann, P. (1989) Reactivity of the human monoclonal antibody 33G2 with repeated sequences of three distinct Plasmodium falciparum antigens. J. Immunol. 142, 3620-3626).

Detailed Description Text (14):
The mAb 33G2 was initially selected due to its reactivity with the P. falciparum antigen Pf155/RESA as detected by immunofluorescence and immunoblotting (see Ex. 1 and ref. 1). Analysis of antibody reactivity with different recombinant P. falciparum blood stage antigens was performed by immunoblotting using recombinant bacterial (E. coli) plaques (Mattei, D., Berzins, K., Wahlgren, M., Udomsangpetch, R., Perlmann, P., Griesser, H. W., Scherf, A., M uller-Hill, B., Bonnefoy, S., Guillotte, M., Langsley, G., Pereira da Silva, L. and Mercereau-Puijalon, O. (1989) Cross-reactive antigenic determinants present on different Plasmodium falciparum bloodstage antigens. Parasite Immunol. 11, 15-30). The mAb showed binding to bacterial plaques expressing parts of the P. falciparum antigens Pf11.1, Ag332 and Pf155/RESA, showing the strongest reactivity with Ag332 expressing plaques (Mattei, D., Berzins, K., Wahlgren, M., Udomsangpetch, R., Perlmann, P., Griesser, H. W., Scherf, A., M uller-Hill, B., Bonnefoy, S., Guillotte, M., Langsley, G., Pereira da Silva, L. and Mercereau-Puijalon, O. (1989). Cross-reactive antigenic determinants present on different Plasmodium falciparum bloodstage antigens. Parasite Immunol.11, 15-30). No binding was seen to bacterial plaques expressing the P. falciparum antigens FIRA or Ag281. The capacity of various synthetic peptides, corresponding to repeated sequences in the antigens Pf11.1, Ag332 and Pf11/RESA, to block the binding of mAb 33G2 to Pf11/RESA as detected by immunofluorescence was analysed (Udomsangpetch, R., Carlsson, J., W ahlin, B., Holmquist, G., Ozaki, L. S., Scherf, A., Mattei, D., Mercereau-Puijalon, O., Uni, S., Aikawa, M., Berzins, K. and Perlmann, P. (1989) Reactivity of the human monoclonal antibody 33G2 with repeated sequences of three distinct Plasmodium falciparum antigens. J. Immunol.142, 3620-3626). Different concentrations of the peptides (up

to 200 .mu.g/ml) were mixed with a fixed concentration of the mAb, which then was used in the immunofluoresce assay (see Ex. 1). The peptide Y (SVTEEIAEEDK).sub.2, corresponding to a dimer of amino acids 2-12 in antigen Ag332 (Mattei, D., Berzins, K., Wahlgren, M., Udomsangpetch, R., Perlmann, P., Griesser, H. W., Scherf, A., M uller-Hill, B., Bonnefoy, S., Guillotte, M., Langsley, G., Pereira da Silva, L. and Mercereau-Puijalon, O. (1989) Cross-reactive antigenic determinants present on different Plasmodium falciparum bloodstage antigens, Parasite Immunol. 11, 15-30), was the most efficient inhibitor of mAb binding, giving complete inhibition of immunofluorescence at 0.2 .mu.g/ml (Udomsangpetch, R., Carlsson, J., W ahlin, B., Holmquist, G., Ozaki, L. S., Scherf, A., Mattei, D., Mercereau-Puijalon, O., Uni, S., Aikawa, M., Berzins, K. and Perlmann, P. (1989) Reactivity of the human monoclonal antibody 33G2 with repeated sequences of three distinct Plasmodium falciparum antigens. J. Immunol. 142, 3620-3626). Also some peptides corresponding to sequences in Pf11.1 and PF155/RESA inhibited mAb 33G2 immunofluorescence but with considerably less efficiency, the Pf11.1 peptide (EEVVEEVVP).sub.2 and the Pf155/RESA peptide both giving complete inhibition at 100 .mu.g/ml. The results show that mAb 33G2 recognizes a family of cross-reactive P. falciparum antigens including Pf11.1, Pf155/RESA and Ag332, the latter antigen being the optimal target for the mAb (Udomsangpetch, R., Carlsson, J., W ahlin, B., Holmquist, G., Ozaki, L. S., Scherf, A., Mattei, D., Mercereau-Puijalon, O., Uni, S., Aikawa, M., Berzins, K. and Perlmann, P. (1989) Reactivity of the human monoclonal antibody 33G2 with repeated sequences of three distinct Plasmodium falciparum antigens. J. Immunol. 142, 3620-3626).

Detailed Description Text (17):
The detailed epitope specificity on the single amino acid level for the mAb 33G2 was performed using the multiple peptide synthesis technique (PEPSCAN) developed by Geysen et al. (J. Immunol. Methods 102, 259-274, 1987). Peptides were synthesized on polyethylene rods on which polymers of polyacrylic acid had been formed by 1:radiation. Polyethylene rods and Pmoc L-amino acids performed as active esthers (Cambridge Research Biochemicals, UK) were used for synthesis according to instructions of the manufacturer. The N-terminals of all peptides were acetylated. As a basis for the mAb 33G2 epitope analysis, the sequence of amino acid residues 1-19 [SEQ ID NO.: 15] (ESVTEEIAEEDKSVIEEAV) of Ag332 (Mattei, D., Berzins, K., Wahlgren, M., Udomsangpetch, R., Perlmann, P., Griesser, H. W., Scherf, A., M uller-Hill, B., Bonnefoy, S., Guillotte, M., Langsley, G., Pereira da Silva, L. and Mercereau-Puijalon, O. (1989) Cross-reactive antigenic determinants present on different Plasmodium falciparum blood-stage antigens. Parasite Immunol. 11, 15-30) was used, containing sequences of the peptides with the highest reactivity with the mAb (Udomsangpetch, R., Carlsson, J., W ahlin, B., Holmquist, G., Ozaki, L. S., Scherf, A., Mattei, D., Mercereau-Puijalon, O., Uni, S., Aikawa, M., Berzins, K. and Perlmann, P. (1989) Reactivity of the human monoclonal antibody 33G2 with repeated sequences of three distinct Plasmodium falciparum antigens. J. Immunol. 142, 3620-3626). All possible overlapping heptapeptides, hexpeptides, pentapeptides and tetrapeptides covering the mentioned sequence were synthesized and their reactivity with mAb 33G2 was analysed by ELISA as described by Geysen et al. (J. Immunol. Methods 102, 259-274, 1987). Culture supernatant containing mAb 33G2 (approx. 10 .mu.g/ml), was diluted 1:100. Peptide containing rods were washed in phosphate-buffered saline with 0.05% Tween 20 between all steps in ELISA. Bound antibodies were detected with a rabbit antihuman IgM-alkaline phosphatase conjugate (Sigma, St. Louis, Mo.) using p-nitrophenyl phosphate, disodium salt (Sigma) as substrate.

☐ 14. Document ID: US 5580855 A

L13: Entry 14 of 16 File: USPT Dec 3, 1996

DOCUMENT-IDENTIFIER: US 5580855 A
TITLE: Peptides

Detailed Description Text (72):
Example 9 was repeated with some groups of mice given indomethacin at various doses rather than the peptide K(D)PT. A control group of mice received neither indomethacin nor K(D)PT. The results are shown in Table 2. The data are the total number of contortions measured during 20 minutes after the ip challenge.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Drawing Desc | Image

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☐ 15. Document ID: US 5389615 A

L13: Entry 15 of 16 File: USPT Feb 14, 1995

DOCUMENT-IDENTIFIER: US 5389615 A
**** See image for Certificate of Correction ****
TITLE: Peptides and pharmaceutical composition thereof in the treatment of pain

Detailed Description Text (78):
Example 9 was repeated with some groups of mice given indomethacin at various doses rather than the peptide K(D)PT. A control group of mice received neither indomethacin nor K(D)PT. The results are shown in Table 2. The data are the total number of contorsions measured during 20 minutes after the ip challenge.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Drawing Desc | Image

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☐ 16. Document ID: US 4591648 A

L13: Entry 16 of 16 File: USPT May 27, 1986

DOCUMENT-IDENTIFIER: US 4591648 A
**** See image for Certificate of Correction ****
TITLE: Histidine protection

Detailed Description Text (80):
N(.alpha.)-t-Butyloxycarbonyl-L-phenylalanyl resin prepared as in Example 13, (0.42 g) is placed in a glass vessel and agitated by passing nitrogen gas upwards through a glass sinter. Peptide synthesis is carried out using a manual procedure, each cycle of the synthesis comprising treatment of the resin with (all solvent volumes 5 ml): (a) dichloromethane 3.times.2 min.; (b) isopropanol 3.times.2 min.; (c) dichloromethane 3.times.2 min.; (d) trifluoroacetic acid in dichloromethane (40% v/v) 1.times.1 min.; (e) trifluoroacetic acid in dichloromethane (40% v/v) 1.times.30 min.; (f) dichloromethane 3.times.2 min.; (g) isopropanol 3.times.2 min.; (h) dichloromethane 3.times.2 min.; repeat (d)-(h); (i) triethylamine in dichloromethane 3.times.2 min.; (j) dichloromethane 5.times.2 min.; (k) coupling with 4 equivalents of t-butyloxycarbonylamino acid and 4.4 equivalents of dicyclohexylcarbodiimide in dichloromethane (5 ml) except in the case of N(.alpha.)-t-butyloxycarbonyl, N(.omega.)-nitroarginine when dimethylformamide (5 ml) is used coupling is performed once for 4 h, then once for 16 h (except in the case of N(.alpha.)-t-butyloxycarbonyl, N(.pi.)-benzyloxymethyl-L-histidine which is coupled once only for 4 h). Half of the final protected peptide-resin conjugate is washed with trifluoroacetic acid (10 ml) and then suspended in trifluoroacetic acid (5 ml) containing methoxybenzene (1 ml). A stream of hydrogen bromide gas is passed for

1h. Filtration and evaporation gives crude partially protected peptide hydrobromide which is triturated with ether, dissolved in 25% aqueous acetic acid, and passed several times through a column of Amberlite IR45 acetate form ion exchange resin, eluting with 25% aqueous acetic acid. Evaporation gives a hygroscopic solid which is dissolved in 80% aqueous acetic acid (10 ml). The solution is hydrogenated for 24 h in the presence of 10% palladium on carbon (50 mg) after which t.l.c. reveals only one major component. The solvent is removed and the oily residue (180 mg) is dissolved in 25% aqueous acetic acid and fractionated on a Sephadex G25 gel column swollen and eluted with 25% aqueous acetic acid. The Pauly-active fractions are combined and the gel filtration is repeated twice. T.l.c. still shows trace impurities so the peptide is dissolved in 0.0185M trimethylammonium acetate buffered to pH 4.2 and applied to a Whatman CM52 carboxymethyl cellulose cation exchange column (0.9.times.30 cm) and eluted with a linear pH and concentration gradient of 0.0185 pH 4.2 to 0.185 M pH 5.2 trimethylammonium acetate. The major Pauly active component is collected and the aqueous buffer is evaporated. The residue is repeatedly evaporated from water and finally dried in vacuo to give 5-isoleucine angiotensin II as a hygroscopic white solid (80 mg, 34%) which is indistinguishable from an authentic sample by t.l.c. in several systems or by 300 MNz n.m.r. spectroscopy. The specific rotation is [.alpha.].sub.D.sup.20 -65.5.degree. (c 0.5, MHCl), calculated using concentration values for the monoacetate determined by amino acid analysis after hydrolysis of the solution in the presence of an internal standard: lit K Arakawa and F M Bumpus, J. Amer Chem Soc 1961, 83, 728 [.alpha.].sub.D.sup.20 -67.degree. (c 0.4 M HCl) for the monoacetate. Amino acid analysis: Asp. 1.06; Arg. 1.01; Val. 1.01; tyr. 1.00; Ileu 0.99; His. 1.00; Pro. 0.99; Phe. 1.06.

Term	Documents
K	1582064
KS	78689
D	4354884
DS	225006
PEPTIDE	112724
PEPTIDES	94509
REPEAT$3	0
REPEAT	191918
REPEATA	52
REPEATAB	22
REPEATABE	2
((K WITH D) WITH PEPTIDE WITH REPEAT$3).PGPB,USPT,USOC.	16

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☐ 1. Document ID: US 5849809 A

L9: Entry 1 of 22 File: USPT Dec 15, 1998

DOCUMENT-IDENTIFIER: US 5849809 A
TITLE: Hydroxyalkylated high performance curable polymers

DATE ISSUED (1):
19981215

Detailed Description Text (9):
The general reaction scheme, illustrated below for the chloromethylated polymer, is as follows: ##STR53## wherein a, b, c, d, e, f, g, h, i, j, k, and m are each integers of 0, 1, 2, 3, or 4, provided that the sum of i+e is no greater than 4, the sum of j+f is no greater than 4, the sum of k+g is no greater than 4, and the sum of m+h is no greater than 4, provided that at least one of a, b, c, and d is equal to or greater than 1 in at least some of the monomer repeat units of the polymer, and provided that at least one of e, f, g, and h is equal to at least 1 in at least some of the monomer repeat units of the polymer, and n is an integer representing the number of repeating monomer units.

Detailed Description Text (46):
The general reaction scheme is as follows: ##STR83## wherein a, b, c, d, e, f, g, h, i, j, k, and m are each integers of 0, 1, 2, 3, or 4, provided that the sum of i+e is no greater than 4, the sum of j+f is no greater than 4, the sum of k+g is no greater than 4, and the sum of m+h is no greater than 4, provided that at least one of a, b, c, and d is equal to or greater than 1 in at least some of the monomer repeat units of the polymer, and provided that at least one of e, f, g, and h is equal to at least 1 in at least some of the monomer repeat units of the polymer, and n is an integer representing the number of repeating monomer units. In the corresponding reaction with methacryloyl chloride, the ##STR84## groups are replaced with ##STR85## groups.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

☐ 2. Document ID: US 5773577 A

L9: Entry 2 of 22 File: USPT Jun 30, 1998

DOCUMENT-IDENTIFIER: US 5773577 A
TITLE: Products comprising substrates capable of enzymatic cross-linking

DATE ISSUED (1):
19980630

Detailed Description Text (47):
Of particular interest are polymers having short repeat units comprising a reactive linking amino acid, particularly carboxy, amino, and thiol functionality, such as D, E, K, R, and C. Particularly, the unit will be of from 3 to 10, usually 3 to 6 amino acids, where 1 or more amino acids will be glycine or alanine, usually fewer than 100% of the amino acids other than the reactive amino acid, generally being from about 20 to 75% of the total number of amino acids. Conveniently, one may replace one of the amino acids of a repeating unit with the reactive amino acid, so that the structure of the polymer is not significantly modified.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 3. Document ID: US 5766606 A

L9: Entry 3 of 22 File: USPT Jun 16, 1998

DOCUMENT-IDENTIFIER: US 5766606 A
** See image for Certificate of Correction **
TITLE: Cloning of non-IgA Fc binding forms of the group B streptococcal beta antigens

DATE ISSUED (1):
19980616

Detailed Description Text (106):
Michel, J. L., L. C. Madoff, K. Olson, D. E. Kling, D. L. Kaspar, F. M. Ausubel (1992) "Large, identical, tandem-repeating units in the C protein alpha antigen gene, bca, of group B streptococci," Proc. Natl. Acad. Sci. USA 89:10060-10064.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 4. Document ID: US 5761809 A

L9: Entry 4 of 22 File: USPT Jun 9, 1998

DOCUMENT-IDENTIFIER: US 5761809 A
TITLE: Process for substituting haloalkylated polymers with unsaturated ester, ether, and alkylcarboxymethylene groups

DATE ISSUED (1):
19980609

Detailed Description Text (17):
The general reaction scheme is further illustrated below for the acrylate salt substitution reaction with the specific chloromethylated polymer indicated hereinabove: ##STR60## wherein X is any suitable cation, such as sodium, potassium, or the like, a, b, c, d, e, f, g, h, i, j, k, and m are each integers of 0, 1, 2, 3, or 4, provided that the sum of i+e is no greater than 4, the sum of j+f is no greater than 4, the sum of k+g is no greater than 4, and the sum of m+h is no greater than 4, provided that at least one of a, b, c, and d is equal to or greater than 1 in at least some of the monomer repeat units of the polymer, and provided that at least one of e, f, g, and h is equal to at least 1 in at least some of the monomer repeat units of the

polymer, and n is an integer representing the number of repeating monomer units. In the corresponding reaction with the methacrylate salt, the reaction proceeds as shown above except that the ##STR61## groups shown above are replaced with ##STR62## groups. In the corresponding reaction with the alkoxide salt the reaction proceeds as shown above except that the ##STR63## groups shown above are replaced with ##STR64## groups. Suitable ether groups include those wherein R is an alkyl group, preferably with from 1 to about 30 carbon atoms, more preferably with from 1 to about 15 carbon atoms, and most preferably with 1 carbon atom. In the corresponding reaction with the alkylcarboxylate salt, the reaction proceeds as shown above except that the ##STR65## groups shown above are replaced with ##STR66## groups, wherein R is an alkyl group (including saturated, unsaturated, and cyclic alkyl groups), preferably with from 1 to about 30 carbon atoms, more preferably with from 1 to about 6 carbon atoms, a substituted alkyl group, an aryl group, preferably with from 6 to about 30 carbon atoms, more preferably with from 1 to about 2 carbon atoms, a substituted aryl group, an arylalkyl group, preferably with from 7 to about 35 carbon atoms, more preferably with from 7 to about 15 carbon atoms, or a substituted arylalkyl group, wherein the substituents on the substituted alkyl, aryl, and arylalkyl groups can be (but are not limited to) alkoxy groups, preferably with from 1 to about 6 carbon atoms, aryloxy groups, preferably with from 6 to about 24 carbon atoms, arylalkyloxy groups, preferably with from 7 to about 30 carbon atoms, hydroxy groups, amine groups, imine groups, ammonium groups, pyridine groups, pyridinium groups, ether groups, ester groups, amide groups, carbonyl groups, thiocarbonyl groups, sulfate groups, sulfonate groups, sulfide groups, sulfoxide groups, phosphine groups, phosphonium groups, phosphate groups, mercapto groups, nitroso groups, sulfone groups, acyl groups, acid anhydride groups, azide groups, and the like, wherein two or more substituents can be joined together to form a ring.

☐ 5. Document ID: US 5753783 A

L9: Entry 5 of 22 File: USPT May 19, 1998

DOCUMENT-IDENTIFIER: US 5753783 A
TITLE: Process for haloalkylation of high performance polymers

DATE ISSUED (1):
19980519

Detailed Description Text (11):
The general reaction scheme, illustrated below for the acryloylation of the chloromethylated polymer, is as follows: ##STR53## wherein X is any suitable cation, such as sodium, potassium, or the like, a, b, c, d, e, f, g, h, i , k, and m are each integers of 0, 1, 2, 3, or 4, provided that the sum of i+e is no greater than 4, the sum of j+f is no greater than 4, the sum of k+g is no greater than 4, and the sum of m+h is no greater than 4, provided that at least one of a, b, c, and d is equal to or greater than 1 in at least some of the monomer repeat units of the polymer, and provided that at least one of e, f, g, and h is equal to at least 1 in at least some of the monomer repeat units of the polymer, and n is an integer representing the number of repeating monomer units. In the corresponding reaction with the methacrylate salt, the reaction proceeds as shown above except that the ##STR54## groups shown above are replaced with ##STR55## groups.

Detailed Description Text (18):
The general reaction scheme, illustrated below with a chloromethylated polymer and an allyl alcoholate salt, is as follows: ##STR60## wherein X is any suitable cation, such as sodium, potassium, or the like, a, b, c, d, e, f, g, h, i, j, k, and m are each integers of 0, 1, 2, 3, or 4, provided that the sum of i+e is no greater than 4, the sum of j+f is no greater than 4, the sum of k+g is no greater than 4, and the sum of m+h is no greater than 4, provided that at

least one of a, b, c, and d is equal to or greater than 1 in at least some of the monomer repeat units of the polymer, and provided that at least one of e, f, g, and h is equal to at least 1 in at least some of the monomer repeat units of the polymer, and n is an integer representing the number of repeating monomer units, and n is an integer representing the number of repeating monomer units. In the corresponding reaction with the 2-allylphenolate salt, the reaction proceeds as shown above except that the ##STR61## groups shown above are replaced with ##STR62## groups.

Detailed Description Text (25):
The general reaction scheme to place unsaturated ammonium or phosphonium groups on the polymer, illustrated below for the reaction with N,N-dimethylethyl methacrylate, is as follows: ##STR67## Or, more generally, ##STR68## wherein a, b, c, d, e, f, g, h, i, i k, and m are each integers of 0, 1, 2, 3, or 4, provided that the sum of i+e is no greater than 4, the sum of j+f is no greater than 4, the sum of k+g is no greater than 4, and the sum of m+h is no greater than 4, provided that at least one of a, b, c, and d is equal to or greater than 1 in at least some of the monomer repeat units of the polymer, and provided that at least one of e, f, g, and h is equal to at least 1 in at least some of the monomer repeat units of the polymer, and n is an integer representing the number of repeating monomer units.

Detailed Description Text (29):
The general reaction scheme, illustrated below for the chloromethylated polymer, is as follows: ##STR69## wherein a, b, c, d, e, f, g, h, i, j, k, and m are each integers of 0, 1, 2, 3, or 4, provided that the sum of i+e is no greater than 4, the sum of j+f is no greater than 4, the sum of k+g is no greater than 4; and the sum of m+h is no greater than 4, provided that at least one of a, b, c, and d is equal to or greater than 1 in at least some of the monomer repeat units of the polymer, and provided that at least one of e, f, g, and h is equal to at least 1 in at least some of the monomer repeat units of the polymer, and n is an integer representing the number of repeating monomer units.

Detailed Description Text (68):
The general reaction scheme, illustrated below for the hydroxymethylated polymer, is as follows: ##STR102## wherein a, b, c, d, e, f, g, h, i, j, k, and m are each integers of 0, 1, 2, 3, or 4, provided that the sum of i+e is no greater than 4, the sum of j+f is no greater than 4, the sum of k+g is no greater than 4, and the sum of m+h is no greater than 4, provided that at least one of a, b, c, and d is equal to or greater than 1 in at least some of the monomer repeat units of the polymer, and provided that at least one of e, f, g, and h is equal to at least 1 in at least some of the monomer repeat units of the polymer, and n is an integer representing the number of repeating monomer units. In the corresponding reaction with methacryloyl chloride, the ##STR103## groups are replaced with ##STR104## groups.

☐ 6. Document ID: US 5739254 A

L9: Entry 6 of 22 File: USPT Apr 14, 1998

DOCUMENT-IDENTIFIER: US 5739254 A
**** See image for Certificate of Correction ****
TITLE: Process for haloalkylation of high performance polymers

DATE ISSUED (1):
19980414

Detailed Description Text (11):
The general reaction scheme, illustrated below for the acryloylation of the chloromethylated

polymer, is as follows: ##STR53## wherein X is any suitable cation, such as sodium, potassium, or the like, a, b, c, d, e, f, g, h, i, j, k, and m are each integers of 0, 1, 2, 3, or 4, provided that the sum of i+e is no greater than 4, the sum of j+f is no greater than 4, the sum of k+g is no greater than 4, and the sum of m+h is no greater than 4, provided that at least one of a, b, c, and d is equal to or greater than 1 in at least some of the monomer repeat units of the polymer, and provided that at least one of e, f, g, and h is equal to at least 1 in at least some of the monomer repeat units of the polymer, and n is an integer representing the number of repeating monomer units. In the corresponding reaction with the methacrylate salt, the reaction proceeds as shown above except that the ##STR54## groups shown above are replaced with ##STR55## groups.

Detailed Description Text (18):
The general reaction scheme, illustrated below with a chloromethylated polymer and an allyl alcoholate salt, is as follows: ##STR60## wherein X is any suitable cation, such as sodium, potassium, or the like, a, b, c, d, e, f, g, h, i, j, k, and m are each integers of 0, 1, 2, 3, or 4, provided that the sum of i+e is no greater than 4, the sum of j+f is no greater than 4, the sum of k+g is no greater than 4, and the sum of m+h is no greater than 4, provided that at least one of a, b, c, and d is equal to or greater than 1 in at least some of the monomer repeat units of the polymer, and provided that at least one of e, f, g, and h is equal to at least 1 in at least some of the monomer repeat units of the polymer, and n is an integer representing the number of repeating monomer units, and n is an integer representing the number of repeating monomer units. In the corresponding reaction with the 2-allylphenolate salt, the reaction proceeds as shown above except that the ##STR61## groups shown above are replaced with ##STR62## groups.

Detailed Description Text (25):
The general reaction scheme to place unsaturated ammonium or phosphonium groups on the polymer, illustrated below for the reaction with N,N-dimethylethyl methacrylate, is as follows: ##STR66## Or, more generally, ##STR67## wherein a, b, c, d, e, f, g, h, i, j, k, and m are each integers of 0, 1, 2, 3, or 4, provided that the sum of i+e is no greater than 4, the sum of j+f is no greater than 4, the sum of k+g is no greater than 4, and the sum of m+h is no greater than 4, provided that at least one of a, b, c, and d is equal to or greater than 1 in at least some of the monomer repeat units of the polymer, and provided that at least one of e, f, g, and h is equal to at least 1 in at least some of the monomer repeat units of the polymer, and n is an integer representing the number of repeating monomer units.

Detailed Description Text (29):
The general reaction scheme, illustrated below for the chloromethylated polymer, is as follows: ##STR68## wherein a, b, c, d, e, f, g, h, i, j, k, and m are each integers of 0, 1, 2, 3, or 4, provided that the sum of i+e is no greater than 4, the sum of j+f is no greater than 4, the sum of k+g is no greater than 4, and the sum of m+h is no greater than 4, provided that at least one of a, b, c, and d is equal to or greater than 1 in at least some of the monomer repeat units of the polymer, and provided that at least one of e, f, g, and h is equal to at least 1 in at least some of the monomer repeat units of the polymer, and n is an integer representing the number of repeating monomer units.

Detailed Description Text (68):
The general reaction scheme, illustrated below for the hydroxymethylated polymer, is as follows: ##STR95## wherein a, b, c, d, e, f, g, h, i, j, k, and m are each integers of 0, 1, 2, 3, or 4, provided that the sum of i+e is no greater than 4, the sum of j+f is no greater than 4, the sum of k+g is no greater than 4, and the sum of m+h is no greater than 4, provided that at least one of a, b, c, and d is equal to or greater than 1 in at least some of the monomer repeat units of the polymer, and provided that at least one of e, f, g, and h is equal to at least 1 in at least some of the monomer repeat units of the polymer, and n is an integer representing the number of repeating monomer units. In the corresponding reaction with methacryloyl chloride, the ##STR96## groups are replaced with ##STR97## groups.

☐ 7. Document ID: US 5595740 A

L9: Entry 7 of 22 File: USPT Jan 21, 1997

DOCUMENT-IDENTIFIER: US 5595740 A
**** See image for Certificate of Correction ****
TITLE: Cloning of non-IgA FC binding forms of the group B streptococcal beta antigens

DATE ISSUED (1):
19970121

Detailed Description Text (106):
Michel, J. L., L. C. Madoff, K. Olson, D. E. Kling, D. L. Kaspar, F. M. Ausubel (1992) "Large, identical, tandem-repeating units in the C protein alpha antigen gene, bca, of group B streptococci," Proc. Natl. Acad. Sci. U.S.A. 89:10060-10064.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

☐ 8. Document ID: US 5384196 A

L9: Entry 8 of 22 File: USPT Jan 24, 1995

DOCUMENT-IDENTIFIER: US 5384196 A
TITLE: Polyarylene sulfide composite materials and preparation thereof

DATE ISSUED (1):
19950124

Brief Summary Text (15):
The PAS materials used in the invention include polymers in which aromatic residues combined to each other via a thioether linkage, in particular polymers comprising predominantly of at least one of repeating units (I)-(VI): ##STR1## wherein Y is --R, --OR, --OM, --COOR, --COOM, --NR.sub.2, --CONR.sub.2 or --CN, where R represents hydrogen, a C.sub.1 -C.sub.24 alkyl group, or a C.sub.6 -C.sub.24 cycloalkyl, aryl or aralkyl group and M represents an alkali metal; X is --CO--, --CONR.sup.1 --, --SO--, --SO--, --CR.sup.2 R.sup.3 --or --SiR.sup.2 R.sup.3 --, where R.sup.1, R.sup.2 and R.sup.3 each represent hydrogen, a C.sub.1 - C.sub.24 alkyl group or a C.sub.6 -C.sub.24 cycloalkyl, aryl or aralkyl group; a is an integer of 0-4; b is an integer of 0-2; c is an integer of 0-4; d is an integer of 0-3; e is an integer of 0-3; f is an integer of 0-3; g is an integer of 0-5; h is an integer of 0-4; i is an integer of 0-4; j is an integer of 0-4; k is an integer of 0-4; and n is an integer of 1-3.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

☐ 9. Document ID: US 5075043 A

L9: Entry 9 of 22 File: USPT Dec 24, 1991

DOCUMENT-IDENTIFIER: US 5075043 A
TITLE: Optical article containing a linear condensation polymer exhibiting a high level of second order polarization susceptibility

DATE ISSUED (1):
19911224

Brief Summary Text (31):
G. D. Green, H. K. Hall, J. E. Mulvaney, J. Noonan, and D. J. Williams, "Donor-Acceptor-Containing Quinodimethanes. Synthesis and Copolyesterification of Highly Dipolar Quinodimethanes", Macromolecules, 20, 716-722 (1987) and G. D. Green, J. I. Weinschenk, J. E. Mulvaney, and H. K. Hall, "Synthesis of Polyesters Containing a Nonrandomly Placed Highly Polar Repeat Unit", Macromolecules, 20, 722-726 (1987), each disclose linear condensation polymers containing molecular dipole repeating units in the polymer backbone. Sulfonyl electron acceptors are not disclosed.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 10. Document ID: US 5026872 A

L9: Entry 10 of 22 File: USPT Jun 25, 1991

DOCUMENT-IDENTIFIER: US 5026872 A
TITLE: Aromatic ether-ketone polyamines, intermediates and products, and methods for preparing same

DATE ISSUED (1):
19910625

Detailed Description Text (49):
In accordance with this embodiment of the present invention, novel polyimide compounds are provided in the form of compounds comprising repeating units of the formula: ##STR42## wherein q is an integer of from about 5 to about 250; k is a dianhydride compound selected from the group consisting of: ##STR43## wherein L is selected from ##STR44## and divalent organic radicals of the general formula ##STR45## where M is a member selected from the class consisting of divalent radicals of the formulas, --C.sub.S H.sub.2 --, ##STR46## --O-- and --S-- where O is 0 or 1, S is a whole number from 1 to 5, the divalent bonds of the --O--L--O-- radical are situated on the phthalic anhydride end groups, e.g., in the 3,3', 3,4'-4,3'- or the 4'4'-positions; wherein A is a valence bond or a divalent radical selected from the group consisting of: ##STR47## wherein n is an integer of from 1 to 10; ##STR48## D is valence bond or a ##STR49## radical.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 11. Document ID: US 4707357 A

L9: Entry 11 of 22 File: USPT Nov 17, 1987

DOCUMENT-IDENTIFIER: US 4707357 A
**** See image for Certificate of Correction ****
TITLE: Immunologically active peptides capable of inducing immunization against malaria and genes encoding therefor

DATE ISSUED (1):
19871117

Detailed Description Text (13):
When a peptide of the invention is synthesized containing both the repeat sequences and one or more of the peptide sequences identified as Region I or Region II, those peptides which are preferred contain from 2 to 50 of the repeating units followed by a peptide sequence containing the sequence of Region II and preceded by a peptide sequence containing the sequence of Region I. A particularly preferred peptide contains a sequence of the formula Lys-Pro-Lys-His-Lys-Lys-Leu-Lys-Gln-Pro-Gly-Asp-Gly-Asn-Pro-Asp-Pro-Asn-Al a-Asn-Pro-Asn-Val-Asp-Pro-Asn-Ala-Asn-Pro-Asn-Val-Asp-Pro-Asn-Ala-Asn-Pro-A sn-Val-Asp-Pro-Asn-Ala-Asn-Pro-Asn-Ala-Asn-Pro-Asn-Ala-Asn-Pro-Asn-Ala-Asn- Pro-Asn-Ala-Asn-Pro-Asn-Ala-Asn Pro-Asn-Ala-Asn-Pro-Asn-Ala-Asn-Pro-Asn-Ala-Asn-Pro-Asn-Ala-Asn-Pro-Asn-Al a-Asn-Pro-Asn-Ala-Asn-Pro-Asn-Ala-Asn-Pro-Asn-Ala-Asn-Pro-Asn-Ala-Asn-Pro-A sn-Ala-Asn-Pro-Asn-Val-Asp-Pro-Asn-Ala-Asn-Pro-Asn-Ala-Asn-Pro-Asn-Ala-Asn- Pro-Asn-Ala-Asn-Pro-Asn-Ala-Asn Pro-Asn-Ala-Asn-Pro-Asn-Ala-Asn-Pro-Asn-Ala-Asn-Pro-Asn-Ala-Asn-Pro-Asn-Al a-Asn-Pro-Asn-Ala-Asn-Pro-Asn-Ala-Asn-Pro-Asn-Ala-Ans-Pro-A sn-Ala-Asn-Pro-Asn-Ala-Asn-Pro-Asn-Ala-Asn-Pro-Asn-Ala-Asn-Pro-Asn-Ala-Asn- Pro-Asn-Lys-Asn-Asn-Gln-Gly-Asn Gly-Gln-Gly-His-Asn-Met-Pro-Asn-Asp-Pro-Asn-Arg-Asn-Val-Asp-Glu-Asn-Ala-As n-Ala-Asn-Asn-Ala-Val-Lys-Asn-Asn-Asn-Asn-Glu-Glu-Pro-Ser-Asp-Lys-His-Ile-G lu-Gln-Tyr-Leu-Lys-Lys-Ile-Lys-Asn-Ser-Ile-Ser-Thr-Glu-Trp-Ser-Pro-Cys-Ser- Val-Thr-Cys-Gly-Asn-Gly.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWMC | Draw Desc | Image

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☐ 12. Document ID: US 3960832 A

L9: Entry 12 of 22 File: USPT Jun 1, 1976

DOCUMENT-IDENTIFIER: US 3960832 A
TITLE: Polysaccharide and bacterial fermentation process for its preparation

DATE ISSUED (1):
19760601

Brief Summary Text (117):
Although the bacteria employed in the present invention are similar in some respects to Azotobacter inducus, Heteropolysaccharide-7 of the present invention differs considerably from the polysaccharide produced by A. indicus. The polysaccharide produced by A. indicus is described as a polymer consisting of glucose, glucuronic acid and aldoheptose in the ratio of 3:2:1 ("Polysaccharide Produced by Azotobacter indicus", C. M. Quinnell, S. G. Knight and P. W. Wilson, Can J. Microbiol., Vol. 3, pg. 277, 1957), and as a linear molecule composed of repeating units of D-glucuronic acid, D-glucose and D-glycero-D-mannoheptose ("The Structure of the Extracellular Polysaccharide of Axotobacter indicum," V. M. Parikh and J. K. N. Jones, Can. J. Chem., Vol. 41(II), pgs. 2826- 35 (1963). The heteropolysaccharides reported by Lopez et al. (Microbiol. Espan. 1968 21(1- 2) p. 53) as produced by strains of Beijerinckia and Azotobacter also differ from Heteropolysaccharide-7.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWMC | Draw Desc | Image

☐ 13. Document ID: US 3632414 A

L9: Entry 13 of 22 File: USPT Jan 4, 1972

DOCUMENT-IDENTIFIER: US 3632414 A
TITLE: METHOD OF PREPARING FILMS AND COATINGS OF HETEROCYCLIC-AROMATIC POLYMERS

DATE ISSUED (1):
19720104

Brief Summary Text (76):
d. The polymer produced by the self-condensation of 3,4-diamino-1,8-naphthalene dicarboxylic acid can also be represented as having repeating units of formula K.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

☐ 14. Document ID: US 3845022 A

L9: Entry 14 of 22 File: USOC Oct 29, 1974

DOCUMENT-IDENTIFIER: US 3845022 A
TITLE: ELECTROPHOTOGRAPHIC COATING COMPOSITIONS HAVING BROMINE-CONTAINING POLYMER BINDERS

OCR Scanned Text (7):
13 The pigment to resin solids ratio was maintained at 8:1 in all cases, and all electrical measurements were carried out in a controlled room maintained at 50% relative huniidity at 25' C. In Table III the results obtained upon subjecting the above photoconductive coating composition to the "Charge Acceptance," "Dark Decay Rate" and "Light Decay Rate" test procedures described hereinabove are summarized. 318451022 14 erties such as, dark decay rate and light decay rate, are improved. Ogh charge acceptance wiU allow cutting down the coating weight of paper maintaining the charge acceptance of the coated paper at the same level as current commercial paper. 5 In summary, this invention provides novel bromine-containing monomers and novel and improved polymeric binders for electrophotographic compositions derived frohi TABLE lI A B C D B F G H K m N 0 Ingredients, parts: ST ---------- 33.8 67.6 67.6 33.8 67.6 33.8 67.6 13.5 67.6 91 ---------- 33.8 33.8 20.8 DBF ---------- ----- 42.8 85.5 85.5 42.7 85.5 38.5 85.5 17.1 85.5 85.5 ---------- 28.5 42.8 -------- DBM ---------- ---------- ------- ii. 5 ---------- MBM ---------- 5.4 -------- 10.8 ---- ---------- 10.8 7. 7 2.4 ---------- 10.8 ---------- MEM --------- ---------- 7---------- ---------- ---------- 5.3 -------- Monomer of- Ex. VIII ---------- 27.9 ----- --- ---------- ---------- -- Ex. X ---------- 19.7 19.7 ---------- ------- ---------- Ex. XIIL ---------- ---- ---------- 16.7 ---------- ---------- Ex. V ---------- 39.3 ---------- -- ---------- Ex. IV ---------- 16.0 ---------- ---- ---------- Ex. II ---------- ---------- Ex. XI ------ ---------- ---------- ---------- 17.9 ---------- Ex. IX ---------- ----------

---- 12.1 ---------- ----------Ex. VII -----
---- ---------- ----- 7.4 ----------
---------- ---------- Ex. xrv ---------- ---------
---------- 52.5 51.3 ---------- VA ----------
---------- ----------
33.5 ---------- EA ---------- ----------
---------- ---------- 46.9 ---------- Solvent I ----
---------- 98. 0 181.0 183.6 96.2 192.4 95.2 177.5 40.2 205.6 - i@7.8 80.8 65.9 91.0 98 88.1 Benzoyl peroxide --------- 3.0 5.4 5.5 2.9 5.7 2.8 5.4 1.2 6.16 6.81 0.66 0.66 2 0.68 2.93 --- Temp.,' C---------- 85-@90 85-90 85-90 85-90 85-90 85--90 85-90 85-90 85-90 85--90 72-76 85-90 85-90 85-90 Time (hours) ---------- 6.3 6. 0 6.0 6. 0 3. r) S. 0 5.9 6.6 7yg 7 7 r),4 5.5 6 6 Percent conversion ---------- 95. 7 98.7 100.0 100. 0 92.0 95.0 97.8 100 97.6 97.3 go 96 98 98.2 100 Percent bromine ---------- 7.3 6.4 5.4 10.4 10.4 5.3 3.6 9.9 9.6 8.3 17.1 13.7 11.0 8.9 29 Acid number ---------- 33.8 38. 7 38.2 36.4 36.5 37.1 14.1 33.8 34.1 -------- 30 26.9 38.7 36. 7 51.4 I.V. (dl./g.) in toluene --------- 0.09 0.11 0.07 0.07 0.10 0.11 0.12 0.11 0.12 0.11 0.14 0.14 0. 09 0.09 0.10 I Toluene was the solvent In all cases except K and 0; In K a niixture of ethyl acetate (14.5 parts) and toluene (66.5 parts) was used; in 0 a mixture of ethyl acetate (15 parts) and toluene (73.1]parts). 2 t-Butyl peroctoate was used instead of benzoyl peroxide. TABLE III 35 th ese monomers. Li ght decay variations may be made in materials, proportions, and Charge Dark decay rate procedures without departing from the scope of this in- acceptance rate (a ngular vention. Interpolymer (volts) (volts/see.) d egrees) What is claimed is: * ---------- 400 10 80 40 1. A bromine-containing, film forming interpolymer * ---------- 380 5 80 is ting essentially of repeating units derived from at H ---------- 420 3 85 c ons Control ---------- 350 12 70 least one bromine- containing monomer corresponding to B ---------- 480 8 85 C ---------- 440 7 85 the general formula D ---------- 440 6 80 Control ---------- 380 10 75 (3) RI B r E---------- 430 8 80 45 Control ---------- 370 10 75 ECHI--@- CO O-CHI-@=CH-Br] F---------- ------- 460 8 80 Control ---------- : ------- 380 10 75 [(d)] Br I ---------- 500 5 83 1 ---------- ---- 490 6 95 Control ---------- 420 10 70 B r coon K ---------- 560 10 75 0 RI N ---------- 580 6 80 50 Control ---------- 500 12 60 Br COO- CH-CHI-0-8-6=Cus m ---------- 400 10 76 Control -- ---------- ------ 350 12 60 r wherein: RI=H, or --CH3, and at Ieast one ethylenically unsaturated monomer which does not contain bromine and said interpolymer contains about 0.01 to 0.35 mole of bromine-containing monomer per mole of total monomers. R e f e r e n c e s C i t e d U N I T E D S T A T E S P A T E N T S I-IARRY WONG, JR., Primary Examiner U.S. Cl. X.R. 96-1.5; 117-132, 138.8, 140, 144, 155, 161; 260-26, 3 1.2 R, 31.8 R, 32.8 R, 33.6 UA, 42,42.24,47 UA, 78.5 B, 86.1 R, 86.1 E, 86.3, 87.5 R, 473, 475, 485 H, 486 H an acid number of 37.3 and an intrinsic viscosity of 0.11 65 3,562,231 2/1971 D'Aleiio ---------- 260--86.1 R EXAMPLE XVIII 55 This example shows the preparation of a randoni[interpolymer containing 4- bromostyrene, dibutyl funiarate, monobutyl maleate, and styrene. A polymer was prepared by the procedure of Example XV using a charge of 4- bromostyrene (14.2 parts), dibutyl 60 fumarate (42.75 parts), monobutyl maleate (10.75 parts), and styrene (26.7 parts). The polymerization was carried out at 85-90' C. for 6 hours and yielded a polymer having and containing 6.6% bromine. When tested as in Ex XVII, the polymer of this example exhibited properties superior to the control of Example XVII. From the above results it is observed that aU these bromine containing interpolymer systems offer excellent 70 charge acceptance without affecting adversely other electrical properties. As a matter of fact other electrical prop- Interpolyniers

Date Issued (1):
19741029

Full | Title | Citation | Front | Review | Classification | Date | Reference | Claims | KWMC | Draw Desc | Image

15. Document ID: US 3786031 A

L9: Entry 15 of 22 File: USOC Jan 15, 1974

DOCUMENT-IDENTIFIER: US 3786031 A
TITLE: POLYAMIDEURETHANES AND THEIR PREPARATION

OCR Scanned Text (11):
3)786,081 21 concentration of 0.5 g. per 100 ml. of m-cresol and increases to infinity in the case of cross-linked polyrners, said method comprising: (1) forming a diol-diisocyanate admixture of com- pounds comprising a diol of the formula: 0 Ro R, 8 _ I I @l (CH2)5) on HO (CH2)5- NRi-@N- a diisocyanate of the formula O=C-N-R-N=C=O wherein Ro, RI, R2, R, and p are as defined above, at least a stoichiometric quantity of diisocyanate being present in the admixture based on the diol content thereof; (2) allowing said admixture to react under substan- tially anhydrous conditions at a temperature of 50-250' C.; and (3) recovering the polymeric product from the reaction mixture. 17. A method according to claim 16 wherein the diol portion of the admixture includes up to 90% by weight of an alkylene diol, a cycloalkylene diol or an aralkylene diol in which the aliphatic portion has from 2-20 carbon atoms. 18. A method according to claim 16 wherein the diol of the formula is N-6- hydroxycaproyl aminoalcohol. 19. A method according to claim 16 wherein the diol of the formula is N,N'-di-(6- hydroxycaproyl) -diamine. 20. A method according to claim 16 wherein the diol of the formula is an admixture of N-6-hydroxycaproyl aminoalcohol and N, N'-di-(6-hydroxycaproyl)-diamine. 21. A method according to claim 16 wherein the reaction is conducted in the presence of an inert organic solvent. 22. A method according to claim 21 wherein the solvent is a member selected from the grotip consisting of amides, ketones, cycec thioethers and chlorobenzenes. 23. A method according to claim 16 wherein the diisoeyanate is added portionwise to the diol. 24. A method according to claim 23 wherein the diisocyanate is present in an amount of up to a 30% molar excess, based on the stoichiometric amount of diol. 25. A method according to claim 24 wherein the diisocyanate is present in an amount up to a 10% molar excess based on the stoichiometric amount of diol. 26. A method according to claim 16 wherein the reaction is conducted in the presence of a catalytic amount of a catalyst selected from the group consisting of organo tin compounds and tertiary amines. 22 27. A method accordin.- to claim 16 wherein the reac- tio'n temperature is 100-200' C. 28. A polyamideurethane prepared by reacting N,N'-di- (6 - hydroxycaproyl) diamine or N-6-h ydroxycaproyl aminoalcohol with an organic diisocyanate wherein (a) N,N'-di-(6-hydroxycaproyl) diamine is an alkylene, a cycloalkylene, an arylene, an aralkylene, or a heterocyclic dian-dne, each of the two amino groups of said dianiine being either primary or secondary; I 0 (b) said organic diisocyanate is an alkylene, a cycloalkylene, an arylene or an aralkylene diisocyanate; (c) N-6-hydroxycaproyl aminoalcohol is an alkylene, cycloalkylene, aralkylene or :a heterocyclic monoamino monoalcohol; and 15 (d) the degree of polymerization of said polyamide- urethane is such that the inherent viscosity is at least 0.1 when measured in m- cresol at 30' C. at a concentration of 0.5 g. per 100 ml. of m-cresol and increases to infinity in the case of cross-linked 20 polymers. 29. A polymer having a plurality of repeating units of the formula: 0 H 0 11 H 01 11 I I 11 25 F @(CH@)@) 0 C -, n -O(CHg)-.-8-IRl- k"- TIT J. wherein: (a) R, is an alkylene radical having from 2-20 carbon 30 atoms; (b) R is a member selected from the group consisting of alkylene radicals having from 2-20 carbon atoms, diphenylalkylene radicals and lower alkyl substituted diphenylalkylene radicals, the alkyl and alkylene por- 35 tions of which have from 1-2,0 carbon atoms and arylene radicals having from 6-18 carbon atoms; (c) p is an integer having a value of 1-2; and (d) n is a value such that the inherent viscosity is at least 0.4 when measured in m- cresol at 30' C. at a 40 concentration of 0.5 g./100 ml. m-cresol. References Cited FOREIGN PATENTS 45 1,069,558 5/1967 Great Britain ---- 260-77.5 AQ MAURICE J. WELSH, Primary Examiner U.S. Cl. X.R., 260-2.5 AQ 50

Date Issued (1):
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16. Document ID: US 3716518 A

L9: Entry 16 of 22 File: USOC Feb 13, 1973

DOCUMENT-IDENTIFIER: US 3716518 A
TITLE: SILOXANE POLYMERS FOR SOIL-REPELLENT AND SOIL-RELEASE TEXTILE FINISHES

OCR Scanned Text (4):
3,716,518 ClaSi-OH3-CIEE(CIE[s)-CH2-0 /'CHI-CH2-0'\ CR2-CH(CH 3)-Ci-ii-sicia the nature of the monomers selected. For example, where the monomer of Formula I is copolymerized with the monomer of Formula HI, the copolymer wiU contain repeating units of the structure (V) -j /R, R t - Z . - - (C H 2) b j . - S i \ o @ 1 2 and repeating units of the structure (VI) R. R " - O - A l k - O ' \ R " ' - S i / O d / 3 Where the hydrophilic monomer selected is according to Formula IV, the copolymer will contain repeating units as shown in Formula V and repeating units of the structure (Vil) R., R. Si-R""-O-(Alk-0).-R"'-Si d/20 Od/2 As noted hereinabove, we prefer to use monomers (both oleophobic and hydrophilic) wherein each contains at least 2 hydrolyzable groups per silicyl group. Such monomers yield copolymers of greater molecular weight and which are capable of further polymerization-for example, after they are applied to a fibrous material and subjected to a cur,,i g operation. The monomers containing a single . .4 hydrolyzable group are preferably used where it may be desired to limit the degree of i) olymerization and thus they may be used in conjunction with di- or tri-functional monomers to act as chain stoppers. In preparing the copolymers of the invention' the proportions of the monomers may be varied depending on such fact6rs as the number of perfluorinated carbon atoms in the oleophobic monomer, the number of alkyleneoxy groups in the hydrophilic monomer, and the properties desired in the copolymer. In general, the monomers are used in thle ratio of about 0. I to 3 moles of the hydrophiiic monomer- per mole of the oleophobic monomer, with the proviso that the copolymer contain at least 10% fluorine by weight. The copolymers of the invention encompass those which are prepared by copolymerization of the oleophobic ;Ind hydrophilic monomers as above described plus one or more monomers which are different from both of the basic reactants. The additional monomer may be employed to modify.the mechanical properties of the copolymer without materially affecting its ability to provide soil repellency Preparation of the copolymers and soil releasability, or to increase the adherence of the The qopolymer@ of the inventio are p arcd by cgn- 75 copolymer to fibrous substr tes. Typically, the addition4l rep a 7 CHa CHS i CH2=c CO-0-Alk-OTCO-C=CH2 R. 5 H-Si\ Yd R@, Clis CHs Re I / Alk-0 c O-C-- Si-C-CO-0 Si T. 10 Yd' H3 Yd Examples of individual monomers are provided below by way of illustration: C13si-(CH3)8-0- CHI-CHZ-O-(CH2)3- sicls 15 /2 CH3 CH3 si-(CH2)3-0-(r-H2-CH:-O)t#-(CH2)3-St C12 C12 20 A2 CH 25 CIsS!-(C]E[2)9-0-(@H'-CH2--O) (CH:)3-SiCig 120 (CH30) 3Si-(CH2)-O CH2-CM-0 (CH:)3- Si(OCHt)3 1/20 . 30 H H Si-(CH2)&-O- CH2-CH2-0).L-@CH2)a-Si AO C12 Cli H n 35 8 ventional polymerizations used in preparing siloxane polymers. This involves subjecting a mixture of the oleophobic and hydrophilic monomers to hydrolysis. For example, the monomer mixture is stirred with an excess of water, and thefi water and by-products are removed by evaporation. A preferred technique involves- dissoiving the. monomer mixture in a solvent such as acetone, p-dioxane, te trahydroftiran, or other volatile solvent which is at least partly . scible with -water, and adding water to this solu- ml tion with stirring. The reaction mixture is then subjected to evap'qration, preferably under vacuum, to remove solvent, water, and by-products of the hydrolytic polymeeization. The copolymers are generallyviscous liquids which are soluble in most organic solvents, particularly fluorinated solventi such as benzotrifluoride, trichlorotrifluoroethane, 1,3- bistrifluoromethylbenzene, and the like. These polymer- solution's are useful for treating fibrous materials to provide th@m with both soil repellency and soil releaseability The siructure of the copolymers will vary depending on (EtO) 2 @OEt)2 CH3 CH, 40 C13si-6H-CO-O-(CH2-CH2-0)2-CO-@H-Sicis CH3 CIE[3 CH3 CHI @@-CIH-co-o- CH2-CH:-O\ CO-@H-Si/ C12 C12 45 CH3 CHO I 1\ t;1301-L;-uO-O- CH2-CH:-OTCO-6-sicla 12 1 6H@ UAZ CH3 CIE[CH3 50 C13Si-@E-CO-O-(@H' CH2-0) CO-@H-SiCla 7.- CHS CHs CH30 -\ t Co-o- CHr-CUs-0 , \ I TSi- H- uv-uj:i-6i(ouna)3 55 j@o R CH3 CHS H \ I I / SI-CH-C 0- 0-(CH:-CH2- O)so-C O-CH-SI C12 C12 60 H CHS C2H5 :]El \ I I CE3 Si-CII-CO-O-(Cll-CH2--O)B-co-@H-Si (EtO@2 (oEt)3 Many of the

polyoxyalkylene glycols available in com. 65 merce are mixtures of congeners with differing numbers of,alkylencoxy units. Such commercial mixtures are iuftable as starting materials for the syntheses of the- hydrophilic monomers (both those of Formula 11-1 and Formula IV). Among such mixtures are those wherei'n the 70 average number of alkyleneoxy units is 2, 4, 6, 8, 10, 12, 14, 16, 20, 24, 30, or 40, for example.

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☐ 17. Document ID: US 3639348 A

L9: Entry 17 of 22 File: USOC Feb 1, 1972

DOCUMENT-IDENTIFIER: US 3639348 A
TITLE: COPOLYMERS OF PROPARGYL METHACRYLATE AND ACRYLATE

OCR Scanned Text (6):
32639)348 (g) Each of the three albove products is post-treated with forrnaldehyde and diethylamine according to Ex- ample VI, and the reaction products have repeating units of Formula G. (h) Each of the three above products is reacted with 5 phenylnitrile oxide according t6 the procedure of Ex- ample VII(A) and the reaction products have repeating units corresponding to above Formula H. (i) Each of the three above products is reacted with formaldehyde according to the procedure of Example 10 VIII(A) and the reaction products have repeating units corresponding to above Formula K. (j) The products prepared according to preceding paragraph (i) are brominated according to the procedure of Example IX using 2.5 moles of bromine per acetylenic 15 group present in the polymer and the brominated prod- ucts have repeating units therein of the above Fbrmulas L and M. (k) Each of the acetylenic alcohol products from paragraph (i) is reacted with ethylene oxide according 20 to the procedure of Example X(a) and the reaction prod- ucts have repeating units therein of the above Formula N. (1) Each of the thi-ee above products from (a), (b) and (c) is suspended or dissolved in liquid ammonia and reacted with sodamide according to the procedure Of 25 Example XI(a) and the reaction products have repeating units therein of the formula shown below as Formula O'. Portions of these products are further reacted with CuCl as in Example XI(b) and these products have repeating units therein of the formula shown below as Formula P'. 30 (m) Each of the above procedures of paragraphs (a) through (1) is repeated using the block copolymerization technique of Example la to produce a center core of styrene in the linear chain and terminal portions of the acetyleriic repeating units. In each of the postreactions, 35 similar repeating units are obtained as with the random copolymers used above but the postreacted repeating units are at the two ends of the block copolymers. The repeating units in the various pfoducts produced in the above Example have the following structural 40 formulas. In each product the repeating units from styrene are present. In the (a), (b) and (c) products the repeat- ing units from propargyl methacrylate are also present, and these repeatidg units are present in each of the subse- quent reaction products to the extent that they remain unreacted. 45 From Styrene: From Propargyl Methaerylate: -CH2CH- -CI12C (CH3)- uBli5 C 00 CH2C--CH The following repeating units are also present in various 50 products as indicated below: In tile (d) products: - CH2C(CI13)- -CH2C(CI13)- uo(ju-Li2u(br)-- CliBr COOCH2CBr2CllBr2 55 (Forniula A') (Formula B') In the (e) products: -CH2C(CH3)- -CH2C (CH3) - I I BloHlo (Formula C') (Formula D') In the (f) products: 65 -CH2C(CH3)- -CH2C(CH3)- I I I @OOCH2c=cH C U V UJ:i2U@L; L I UU U Uli2U=U.U 70 C C,H,]y H - CH2c(CHa)- C, 0 0 CH2C=Cll -CH2C (CH3)- I I (F, orniula El) (FormIa F') 75 12 Iii the (g) products: -CI12C(CH3)- I aiid COO CH2C=C CH2N(C2H5)2 (F o r m u l a G ') Iii t[ic (h) products: -CH2C(CH3)- I U O O C H 2 C = C H 0 C - C o H 5 N (Forinula H') In the (i) products: -CH2C(CH3)- U V V U-ti2U -- U CH20H and (Formula K') In the (k) products: -CH2C(CH3)- U U U U H 2 C - - C C H 2 0 (C H 2 C H 2 0) @ H (F o r i i i a l a N ') Ill ttio (j) products: - C I

1 2 C (C H 3) - I O O O C H 2 C @ C C H 2 0 H I Br Br (Formula LI) and -CH2C(CH3)- I u o 0 CH2CBr2CBr2CH20H (Formula M') In the (1) products: -CH2C(CH3)- aiid -CH2C (CH3)- I I COOCH2C-CNa U (0 U-112U U CU (Formula 0') (Formula P') EXAMPLE XIII The procedure of Example XII is repeated a number of times including the various postreactions except that in the preparation of the starting copolymers methyl methacrylate is used instead of the styrene. Similar results are obtained in each case, except that in the polymer structures, the repeating unit for methyl methacrylate is present instead of the repeating unit for styrene. This repeating unit has the structure --CH@@c(CH3)- EXAMPLE XIV The procedure of Example XII is repeated a number of times using individuahy in place of the styrene the following comonomers respectively: vinyl naphthalene, vinyl toluene, allyl acrylate, ethyl acrylate, a-methyl styrene and cyclohexyl acrylate. In each case similar results are obtained as in Example XII except that the corresponding repeating units of the respective comonomers COOCH2CH=CHBioHli COOCH2CH--CH2 60 peating units are the same as obtained in the c o r r e s p o n d i n g p o s t r e a c t i o n s f o r E x a m p l e X I I . The repeating units for the propargyl methacrylate are the same as obtained in Example XII and the repeating units for the various postreaction products of these re- employed in this example are substituted for the repeating units for the styrene used in Example XII. The repeating tinits for the propargyl methacrylate and for the various postreacted repeating units are similar to those described in Example XII.

Date Issued (1):
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18. Document ID: US 3563941 A

L9: Entry 18 of 22 File: USOC Feb 16, 1971

DOCUMENT-IDENTIFIER: US 3563941 A
TITLE: SILICONE MODIFIED CARNAUBA WAX

OCR Scanned Text (6):
BF,-CH,CH,OCH2CH3 was hcated to 100' C. and then 6 g. of 0 (CH3)2 IC HZ--CHCH20 (CH2)3S i]20 was added. The mixture was then stripped to 120' C. at I mm. Hg. The product was a smooth wax which had 0.01 equivalent of carboxylic acid group, 0.001 equivalent of epoxy groups remtaining and melted at about,80' C. EXAMPL@E 10 A mixture of 40 g. of the hydrolyzed carnauba wax of Example 9, 50 ml. of tolueiae, 25 g. of 0 (CH3)2 10 2 CHCH20(CH2)3Si]20 and 0.1 g. of KOH was refluxed for 4 hours. The solvent was removed and the residue was a hard, tough wax melting at 79' to 84' C. No indication of acid was found and 0.012 equivalent of epoxy groups remained. EXAMPLE I 1 When each of the following epoxy silicon-containing compounds in an amount proyiding 0.1 equivalent of epoxy group are substituted for 0 (CH3)2 I [C z- CHCH20(CH2)3blj2V in Example I and the procedure of Example I is followed, a silicone-carnauba wax copolymer is produced: 0 CH2C]13 1 (A) C113C-CHCH2CH2CH2Si(OCH2CH20CH)2 CH3 C6H5 (13) Cir3cH2cH-cHcH2CHCH2siocH2cH3 0 CH2cl (C) (CH3)2c C-CH20 CH2cHcH2Si(CH3)3 1 CH3 0 (CH3)2 (CH3)2 I (D) (@H'@bHCH20CH2CIE12CH2sl-u-biLL /0 (C]E[3) 2 C (E) -2- C if C H2 C H2 S i C H2 C]El, C F 2 C 1-1 3 0 CH3 CH3 /\bHCH2cH2 I (F) 6H SiO polymer 0 CH3 CH3 0 (G) dH'@bHC H20(CH2)3sio[(CH3) 2SiOlOOSi(CH2)30CH2CeHbH2 @H3 @113 Si (11) SD) 0 (1) An essentially (CH3)3SiOO.5 endblocked polymer of the repeating units, 0 CH3 I C112--CH-<:D-blu 0 (i) 0 OC112CHCH2 CII3 I I CH2CHCIf2-0-CH2CHCH20(CH2)3Si(OCH2CH3)2 (CH3)2' 0 I (K) Si[OSiCH2CH2CH20CH@CH-CH2]4 0 (C H2 C 6T:15) 2 C 112- C 11 C II2 C 112 S i (O C H3) 0 CH2CI cir3 \ I I (,\I) (C JIL,-- C IT 0 U U U 112 V U II 2 U il 2) 2 S i (O C 112 C H C TI3) 2 3,563,941 12 (N) A copolymcr of 30 mol percent (C6H5)(CH3) SiO units, 20 mol percent 0 COH5 C H2--CHCH20 C H2CH2ClI2 S io units and 50 mol percent 0 CH3 I CHz--CHCH20(CH2)3blV 10 units (0) 0 ci / \ I CiIz--C HC IICH2 S i(C6HII)3 (P) 0 CH2cH2c PI 3 CH2--CHCH2CI12S i(O COHiCI)2 0 (Q) CH3(CH2)5CHCHCH2S i(O CH2CH2CH3)3 0 (CH2CH3)2 I 20 (R) <:D-CH-CH-CH20 (CH2)3 S i-O-S l(CH3)3 CH3 (CH3)2 I - I (S) CICH2CH2CHCHCI120(CH2)3SI-0 SIOH 1 25

CH2cH2CII3 (T) Cil 0 CGH5 I I u.u3L;11-CH,CHCHC112CI12Si(OC113)2 0 OH CH3 I 30 (U) CIIZ-Cll-CH2CH-CI12CH2siH I C113 (V) 0 (CHZ--CH)3SI(OCH2CH2CF3) 35 CH-CH2 CH3 \CH-' (W) 0 Si(OCH2CH3)2 2 40 (X) (0-CH-CH2 CH CH-CH20CH2CH2cH2 3sice,15 CHr-CH2 (Y) A copolymer of 5 mol percent 45 (CH3) 2 CH2=Cl@LblUo.5 UnlUS 20 mol percent CH3CH2SiOl.5 units, 20 mol percent (CH3CH2) (CH3) SiO units, 35 mol percent 50 0 CH2CHs CH2--CHCH2CH2CH2SiO and 20 mol percent 55 /0 \ CHZ--CHCH20 (CH2)3slol.s That which is claimed is: 1. A silicone-carnauba wax copolymer consisting essentially of a silicon- containing moiety bonded to car- 60 nauba wax moiety through an organic radical attached to a silicon atom through a silicon-carbon bond and said organic radical linking the silicon-containing moiety and the carnauba wax moiety by at least 60% ether linkages, said carnauba wax moiety being bonded to the silicon- 65 containing moiety through an oxygen atom wbich in the unre acted state is contained by a hydroxyl radical of the carnauba wax, said silicon-containing moiety consisting essentially of at least one silicon atom to which is bonded through a silicon-carbon bond at least one divalent 70 organic radical consisting essentially of carbon atoms, hydrogen atoms and oxygen atoms, and said silicon-containing moiety being present in an amount of from 5 to 70 weight percent based on the combined weight of the silicon-containing moiety and the carnatiba wax 75 nioiety.

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☐ 19. Document ID: US 3562218 A

L9: Entry 19 of 22 File: USOC Feb 9, 1971

DOCUMENT-IDENTIFIER: US 3562218 A
TITLE: COPOLYMERS OF ACETYLENIC ACRYLATES AND METHACRYLATES

OCR Scanned Text (6):
3, 562@ 21.8 solution, the sodamide can be formed in situ by adding small pieces of metallic sodium to the liquid ammonia. The reaction is continued for a period of about 2 hours after the desired amount of sodamide or sodium has been added. The polymeric metallic derivative is recovered by allowing the ammonia to evaporate gradually and then 5 the precipitate is dissolved in dioxane and the resulting solution is filtered. Tests on the polymeric product show that the sodium has replaced the hydrogen in the terminal acetylenic groups. 10 (b) The polymer metallic derivative is dissolved or suspended in dioxane and reacted with dioxane solutions or suspensions of copper chloride, zinc chforide and co- balt chloride respectively to replace the sodium by the respective other metals. 15 (e) An alkyl radical is added onto the acetylenic group in place of the sodium by adding an alkvl halide gradii- ally to a dioxane solution of the sodium acetylene poly- mer. In this case the alkyl group replaces the sodium and sodium chloride is precipitated. The alkyl acetylene 20 derivative polymer is subsequentlv recovered by dissolv- ing in ether or dioxane and separated from the pre- cipitated salt by filtration. (d) Lithium is added to the acetylenic group by sub- stituting butyl lithium for the sodamide used above in 25 paragraph (a). EXAMPLE XII The procedure of Example I is repe,,tted three times tising the followin@ monorneric mixtures respectively- 30 (a) 75 parts styrene, 25 i)arts 3-butyn-1-yl acrylite. (b) 50 parts styrene, 50 parts 3-butyn-1-yi acrylate. (e) 90 parts styrene, 10 parts 3-butyn-1-yl acrylate. (d) Each of the three above products is postbromin- ated according to the procedure of Example 11 tO give brominated products having repeating units shown in the 35 above Formulas A and B. (e) Each of the three above products is decaboronated according to the procedure of Example V and the decaboronated products have repeating units having the 40 above Formulas C and D. (f) Each of the three above products is crosslinked both thermally and also with 10% styrene monomer according to the procedures of Examples III and IV and the crosslinked copolymers have crosslinkages shown in 45 Formulas E and F. (g) Each of the three above products is post-treated with formaldehyde and diethylamine

according to Ex- ample VI and the reaction products have repeating units of formula G. (h) Each of the three above products is reacted with 50 phenyinitrile oxide according to the procedure of Ex- ample VII(A) and the reaction products have repeating unit5 corresponding to above Formula H. (i) Each of the three above products is reacted with formaldehyde according to the procedure of Example 55 VIII(A) and the reaction products have repeating units corresponding to above Formula K. (j) The products prepared according to preceding para- graph (ij are brominated according to the procedure of 60 Example IX lisin@. 2.5 moles of bromine per acetylenic 1 2 group present in the polymer and the brominated products have repeating units iherein of the above Formulas L and M. (k) Each of the acetylenic alcohol products from Paragraph (i) is reacted with ethylene oxide according to the procedure of Example X(a) and the reaction products hpve repeating units therein of the above Formula N. (I) Each of the three above products from (a), (b) and (c) is suspended or dissolved in liquid ammonia and reacted with sodamide according to the procedure of Exaniple XI(a) and the reaction products have repeating uriits therein of the formula shown below as Formula O'. Portions of these products are further reacted with CuCl as in Exaniple XI(b) and these products have repeating tinits therein of the formula shown below as Formula P'. (m) Each of the above procedures of paragraphs (a) through (1) is repeated using the block copolymerization technique of Example la to produce a center core of styrene in the linear chain and terminal portions of the acetylenic repeating units. In each of the postreactions, similar repeating 1-inits are obtained as with the random copolymers used above but the postreacted repeating units are at the two ends of the block copolymers, The repeating units in the various products produced iii the above example have the following structural forniulas. In each product the repeating units from styrene are present. In the (a), (b) and (c) products the repeating units from 3-butyn-1-yl acrylate are also present, and these repeating units are present in each of the slibsequent reaction products to the extent that they remain unreacted. From styrene: From 3-butyn-1-yl-acrylate: -CI12CH-- -CH2clI- 1 1 UBI15 U 0 OUI-12CH2C@CH The following repeating units are also present in various products as indicated below: In the (d) products: _01120H-- -CH@CH- I I UUU(,'-112UI12C (Br)=CHBr COOC112CHL@CBr.,CHBr2 (FormulL A') (Formula B') In the (e) products: -CH2cH- -CH2cH- I I (@UVCJ12CH2CH=CHBicHii UUUUii2CI-12CII-CH2 (Formula C') (Fortnula D') Biol-Ilo In the (f) products: -CH2CH- -CI-12CH- i COOCH2clI.@c@CH @OOC112CH2C@CH I I COOCH2CH2C@Ull U-LI2 -Clі@cii-COOCEI.CE12C@CH -CH2clI- (Forniula E') (Forinula r@ 1) In the (g) products: In the (h) prodlicts: -CH2CH- - CH2cH- I and I c 0 0 CH2CH20@-C CH2N(C21- 15)2 CO OCH2CH2C@CH CO,-Is (Forinul,,i G') 0\ N (Formula H')

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☐ 20. Document ID: US 3536674 A

L9: Entry 20 of 22 File: USOC Oct 27, 1970

DOCUMENT-IDENTIFIER: US 3536674 A
TITLE: ARYLENE SULFIMIDE POLYMERS

OCR Scanned Text (15):
32536)674 29 30 The thiazone repeating unit of the post-heated polymer Post-heating at 400' C. for two hours gives a substantial of Example VIH has the formula: amount (well over one percent) of thiazone structure in each case. -N N- The various monomers described above as suitable for C C 0 > 5 @se in preparing polymers of this invention can be used in mixtures of two or more and likewise the polyamides NH NH can be used in mixtures of two or more to give polymers 101 having a plurality of repeating units of the type defined 02S S02 herein . 10 While certain features of this invention have been EXAMPLE XV described in detail with respect to various embodiments T'he procedure of Example V is repeated successfuny thereof, it will, of

course, be apparent that other modifica- a number of times for the preparation of other polymers tions can be made within the spirit and scope of this of this invention using, in place of the p-phenylenedi- invention and it is not intended to limit the invention amine, an equivalent amount in each case of the fcillow- 15 to the exact details shown above except insofar as they ing polyamines respectively: are defined in the following claims. The invention claimed is: (a) m-phenylenediamine; 1. A fiber forming polymer consisting essentially of (b) triaminobenzene; repeating units selected from the group consisting of: (c) tetraminobenzene; 20 (a) -co co (d) diamino naphthalene; (e) triaminonaphthalene; Ar N-Arl--N (f) tetraaminonaphthalene; -SO2 S02 (g) diaminodiphenyl; (h) triaminodiphenyl; 25 (b) co (i) tetraaminodiphenyl; -Ar N- (j) 4,4'-diaminodiphenyloxide; 'SO2 (k) 4,4diaminodiphenylamine; (1) 4,4'diphenylsulfoxide; C@N- 30 (m) 4,4'-diphenylketone; -Ar NH (n) 4,4'-diphenylsulfone; (o) 4,4'-diphenylsulfoxide; and S02 (p) 4,4'-diphenylmethane. (d) C@N N@C Ar NH Arl Post-heating at 400' C. for two hours gives a substantial 35 \ / amourit (well over one percent) of thiazone structure in S02 NH-SO2 each case. (e) C=N N=C EXAMPLE XVI Ar N- Arl The procedure of Example V is repeated a number of 40 S02 N-SO2 times for the prepartion of polymers using individually there being at least one percent by weight of a least one in place of the bisaccharin an equivalent weight of the repeating unit selected from the group consisting of (c), following respectively: (d), and (e); wherein Ar represents a polyvalent car- (a) thedicyclimideonaphthalene-1,5-dicarboxyl-2,6- bocyclic aromatic radical selected from the group con- disulfonic acid; 45 sisting of benzene, diphenyl and naphthalene, said radical (b) thedicyclicimideofnaphthalene-1,6-dica rboxyl- having the valencies to which said S02 and CO radicals 3,7-disulfonic acid; are paired in positions ortho, or peri to each other on the (c) the dicyclicimide of diphenyl-4,4'dicarboxyl- 3,3' aromatic radical; and Ar' is a polyvalent carbocyclic disulfonic acid; radical selected from the group consisting of benzene, (d) diphenylmethane-4,4'-dicarboxyl-3,3'- disulfonic 50 diphenyl and naphthalene. acid; 2. A fiber forming polymer consisting essentially of (e) diphenylsulfide-3,3'-dicarboxyl-4,4'-dissufonic acid; repeating units selected from the group consisting of: (f) diphenylsulfoxide-4,4'-dicarboxyl-3,3'-disulfonic acid; (a) -co co 55 (g) diphenylsulfone-4,4'-dicarboxyl-3,3'-disulfonic acid; Ar NH-Arl-NH and X02S s 02X (h) diphenylamine-3,3'-dicarboxyl-4,4'-disulfonic acid. (b) C 0 Post-heating at 400' C. for two hours gives a substantial -Ar/ @NR- amount (well over one percent) of thiazone structure in 60 each case. s 02X EXAMPLE XVII C=N- Arl NH The procedure of Example V is repeated successfully a number of times using individually in place of the p- 65 phenylenediamine, an equivalent amount in each case (d) N@C of the following respectively: C=N-Ar@l' (a) triaminobenzene; \ Ar NH NH-SO2 (b) diaminonaphthalene; 70 \ / (c) diaminodiphenyl; S02 (d) diaminodiphenyloxide; (e) C=N N=C (e) diaminodiphenylamine; \R/ \N\A@ (f) diaminodiphenylsulfide; and / \ / \ (g) diaminodiphenylmethane. 75 S02 N-SO2

Date Issued (1):
19701027

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWMC | Draw Desc | Image

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☐ 21. Document ID: US 3277033 A

L9: Entry 21 of 22 File: USOC Oct 4, 1966

DOCUMENT-IDENTIFIER: US 3277033 A
TITLE: Polyamides from an isonitrile, a carboxylic acid, an amino and a carbonyl compound and a process for their manufacture

OCR Scanned Text (6):
is a polyester froni a polypropylene oxide, 4,4'-di -phenylmethane-diisocyanate and a 1,2,4-benzene-tricarboxylic acid ester. 6. The process of claim 2 in which said acidic polyester is a polyester from polyethylene -Iycol, 4,4'-diphenyl- methane-diisocyanate and a carboxylic acid anhydride. 7. The process of claim 1, in which a primary amme is used as the nitrogen compound.

8. The process of claim 1, in which said primary amine is 2,4-diaminotoluene. 9. The processof claim 1, in which said primary amine is di-cyclohexylidene-m-phenylene diamine. IO.;The process of claim 1, iii which said primary amine is hexamethylene diamine. 11. The process of cl@aim 1, in which said primar-y amine is benzaldehydehexylamine. 12. The process,of claim 1, in which said primary amine is triethylenctetramine. 13. The process of claim I in which an aldehyde is used as the carbonyl compound. 14. The process of claim 12, in which said aldehyde is terephthalic dialdehyde 15. The process of claim 12, in which said aldehyde is paraformaldehyde. 16. The process of claim 1, in which a ketone is used as the carbonyl compound. 17. The process of claim 15, in which said ketone is cyclohexanone. 18. The process of claim 1, in which said isonitrile is- cyclohexyl-isocyanide. 19. The process of claim 1, in which said isonitrile is- 2,6-diethylphenyl-isocyanide. 20. The process of claiin 1, in which said isonitrile is di-(2-isocyanic-2-methyl-1- propyl)-carbonate. 21. The process of claim 1, in which said isonitrile is a polymeric dihydroxyisonitrile having a molecular weight of 10,000 to 20,000. 22. The process of claim 1, in which said isonitrile is- 1-methyl-3,5-diethyl-2,4-phenylene-diisocyanide. 23. The process (yf claim 1, in which said isonitrile is a co_polymer of 95 percent of styrene and 5 percent of al,Iylisocyanide having a molecular weight of 25,000. 24. The process for the manufacture of polyamides which comprises reacting by contacting a carboxylic acid compound selected from the group consisting of a monocarboxylic, a polycarboxylic acid, a carboxylic acid ester and -a carboxylic acid anhydride, an amine compound selected from the group consisting of a primary amine and a secondary amine, a carbonyl compound selected from the group consisting of an aldehyde and a ketone with an 3,277,033 12, isonitrile compound consisting of an aliphatic isonitrile, an aromatic isonitrue and a heterocyclic isonitrile, at least two of said compounds being bifunctional and at least one of the bifunctional condensation components having a molecular weight of between 3GO and 200,000 and the molar ratios of said compounds being in the range of 50 to 100 percent of the equimolar ratios between carboxylic acid, aminb, carbonyl and isonitrue group, said contacting is carried out at a temperature of about +10' C. to about 10 250' C. in a solvent selected from the group consisting of water, an alcohol, an ester, an ether, an aldehyde a ketone,, a hydrocarbon and a halogenated hydrocar and recovering the formed polyamide 25. A normally solid, substantially water-insoluble 15 -polyamide whose repeating unit con-sists of R I 6-N-@--R-C CO-NH-R@- I I RI K 20 groups where each R is selected from the group consisting of hydrogen an alkyl and an aryl radical and R' is selected from t@e group Consisting of hydrogen, an alkenyl, an arenyl and a cycloalkenyl radical, said repeating units being incorporated by polycondensation to pro- 25 duce said polyamide of, (A) a carboxylic compound, (B) an amino compound, (C) a carbonyl compound, and (D) an isonitrile, at least two of said compounds being bifunctional and at least one of the bifunctional condensation components having a molecular weight of between 30 300 and 200,000 and the equimolar ratios of said compounds being in the range of between 0.5 to 1 and 1.5 to 1 per each individual reactive group. 26. A normally solid substantially water-insoluble polyamide from (A) a carbocylic acid-ethylene glycol polyes- 35 ter having a molecular weight of about 300 to 5000 (B) a primary diamine and a tetramine, (C) an aldehyde, and (D) a monoisocyanide. 27. A normally solid substantially water-insoluble polyamide from (A) a carboxylic acid-ethylene glycql polyes- 40 ter having a molecular weight of 300 to 5000, (B) a primary diamine and a triamine, (C) a ketone, and (D) a diisocyanide. References Cited by the Examiner 45 UGI, Angewandte Chemie, 74, January-June 1962, pages 9-22. LEON J. BERCOVIT'Z, Primary Examiner. 50 DONALD E. CZAJA, Examiner. R. W. GRIF@Fl@N, Assistant Exarniner.

Date Issued (1):
19661004

☐ 22. Document ID: US 3090771 A

L9: Entry 22 of 22 File: USOC May 21, 1963

DOCUMENT-IDENTIFIER: US 3090771 A
TITLE: Chelating monomers and polymers

OCR Scanned Text (1):
3 9 0 9 0 , 7 7 1 Uni,ted States Patent Office Patented May 21, 1963 and/ or 3,090,771 CIIELATING MONOMERS AND POLIINMRS CH2--CIIC)aH40CH2CHCH20H Gaetano F. DAlelio, South Bend, Ind., assignor, by direct k(C)H2coom2 and mesne asagaments, to Dal Mon Research Co., r) which is generalized as Cleveland, Ohio, a corporation of Delaware NoDrawing. FiledMayl2,1960,Ser.No.28,559 20 Claims. (C]. 260- 47) This,invention concems new chelating monomers and polymers and methods for making the new monomers and 10 polyniers. Broadly, this invention deals with PolYmerizable organic compounds having the formula D-011 CHr---CRI-Ar-O-K@-CRCR2 1 15 -Am i and their polymers containing repeating units of the structlire -CII2--CR@.- 20 a-OH [I,O-K'-CROR' 1 I I i A. wherein Am is ahpha-tic @aminocarboxyl acid radical bonded throuah -a nitrogen atom, R' represents hydrogen 25 and,methyl, R represents hydrogen,,and lower;alkyl radicals of I to 6 carbon atoms, K' is a divalent alkylene Tadical of I to 8 carbon iatomsin the linear chain between said valencies @and preferably represents a total of no -than about 16 carbon atoms, Ar represents a di- 30 more valent aromatic hydrocarbon radical and the chloro and fluoro derivatives thereof. Specifically, this invention is directed to the syntheses of these new monomers and to polymerization products obtained by polymerizing a mass comprising t@hese new 35 monomer compoundsin the presence or,absenee of other poly@merizable ethylenic compounds. It is a particular object of this invention to prepare soluble and insoluble polymers having in the polymer molecule a plurality of repeatin-units having the formulaalso givenabove. It 40 is a still further object of this invention to prepare new monomeric and polymeric compounds capable of che- lating metal ions and to provide a method for making such,nionomers and polymers. Heretofore, certain chelating monomers cont-aining a 45 vinyl aryl nucleus have been prepared ibyreacting a vinyl- @aryl benzyl halide with an ammoacid, and this synthesis is dep@-ndent on the expensive and difficulty prepared vinylbenzyl chlonde. Another synthesis involve-s the re- 50 action of chloroacetic,acid with vinylbenzyl!amine which is synthe-sizedfrom the vinylbenzyl halide. A third syn- thesis is even more expensive, involvlng the use of vinyl- b-.nzaldehyde. I have now discovered that chelating monomers having .5 a vinylarylnucleus can be prepared f@rom readuy available alkenyl aryloxyepoxyalkanes of the formula, CHr--CRI-Ar-O (CHR).CR-ORs \ 0 e.g. 1-vinylphenoxy-2,3-epoxypropane 60 O]Efi--C)HCaH400112011-CH2 0 by the siniple reaction with a compound possesslng an OH CH2--CHC6HtO CH2C]EI-CH, I I I j-N(C)H2COOM)2 wherein M is a hydro-gen, a lower alkyl or aryl group, an ammonium base, or,a metal; and that these monomers can be polymerized and copolymerized wit@h each other and with other monom(-rs. I have discovered fuither that I can first polymerize or copolymerize the alkenylaryloxyepoxy-alkane to a polymer product having a plurality of repeating -um,ts of the formula R' 1 Ar-O-K'--CR-CR2 0 and thereafter react the poly@mer with a compound possessin.-,an active hydrogen @and having chelating properties, for example, anamino acid, thus: RI -C]12@- + HN(CH2C 0 Oi'J)2 Ar-O(CHR).CRCR2 RI i-OH Ar-O(CTTR) @CRCR2 I -N(C)H2C)OOM)2 i The ialiphatic aminocarboxylic acids can be represented by H-Am wherein Am, repres(-,nts an aliphatic aminoacid radical attached tothe hydrogen radioal through the nitrogen atom. I As is well knonvn, the conventional ion exchange -resins are incapable of recovering heavy met-al ions from solution- containing @a higher concentration of lalkali- and alkaline-earth ions because surh resins function solely by ion-exchange involving electrovalent bonds, and their performanre -is determined by mass action laws. It will be noted that the opening of the epoxide link-age results in a hydroxy group which is hydrophilic in chara--ter iand assists in the wetting @of the polymer, especially if it is crosslinked, by aqueous solu@tion of metal cat@ions. Illustrative aromatic groups represented by Ar - include, -C6H47-, -C6H3(CH3)-, -C6H2(CH3)= -C6H3(C2H5)-, -C6H3(Cl)-, -C6H2(Cl)= -C6H4-C6H4--, -C6II4-C6H3(Cl)- -C6H3(CH3)-C6H3(Cl)-, -C6H3(@C2H5)-C6H47- -C6H3(Cl)-C6I-13(Cl)-, -C6H3(F)- -C6H2(F)=, -ClOH6--, -ClOH5(Cl)- -ClOH4(Cl)=, -ClOH5(CH3)-, -'CIOH@(C2H5)- -ClOH4(CH3)%-, Cl@H5(F)-, -ClOH5(F)2-, etc. Illustrative examples of the amino acids, H-Am, which can be reacted with,alkenylaryloxyepoxyalkanes are gly- active -hydro.-en and having chelating prop",ties, for ("5 cine, NH?,CH2COOH; -alam,'ne, C H3CH(NH2)COOH; example, an amino acid, more particularly an imino acid, e@g., ser ine, HOCH2CH(NH2)COOH; cystene CIE[2=CHCeH4OCH2CHC112+NH(CH2COOM2 HSC 142CH(NH2)COOH an unobutyric acid, CH3CH2CH(NH2)COOH; threonine 0 70 C H3CH(OH)CH(NH2)COOH; valine OH2---CHCoH40CH201EI-CH2N(CH2COOM)2 I u.ti (CH I)2CHCH(NH2);COOH

WEST Search History

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☐	L20	copolymer with $peptide with repeat$	52
☐	L19	((K or lys or arg or K) with (D or asp ror glu or E)) with $4peptide with repeat$3 with consist$3	4
☐	L18	(K with D) with $4peptide with repeat$3 with consist$3	2
☐	L17	19990402	41
☐	L16	(K with D) with repeat$3 with consist$3	73
☐	L15	(K with D) with peptide with repeat$3 with consist$3	2
☐	L14	(K with D) with peptide with repeat$3	16
☐	L13	(K with D) with peptide with repeat$3	16
☐	L12	(K with D) peptide with repeat$3	0
☐	L11	(RGD or KGD) peptide with repeat$3	3
☐	L10	RGD or KGD peptide with repeat$3	10165
☐	L9	19990402	22
☐	L8	((K with D) or (lys with asp)) with repeat$3 adj (unit? or motif?)	56
☐	L7	((K with D) or (lys with asp)) same repeat$3 adj (unit? or motif?)	137
☐	L6	((K with D) or (lys with asp)) same repeat$3	10456
☐	L5	5514581.pn.	1
☐	L4	19990915	0
☐	L3	(orthokeratolog$4 or ($2shap$2 with (eye? or cornea$))) and (type VI with collagen or transglutaminase)	8
☐	L2	(orthokeratolog$4 or ($2shap$2 with (eye? or cornea))) and (type VI with collagen or transglutaminase)	7
☐	L1	(orthokeratolog$4 or ($2shap$2 with (eye? or cornea))) same (type VI with collagen or transglutaminase)	0

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☐ 1. Document ID: US 20040121954 A1

L20: Entry 1 of 52 File: PGPB Jun 24, 2004

DOCUMENT-IDENTIFIER: US 20040121954 A1
TITLE: Poly(dipeptide) as a drug carrier

Detail Description Paragraph:
[0144] In one embodiment, for example, the inventive poly(glutamate/aspartate) polypeptide is approximately 26,000 to 30,000 dalton molecular weight containing approximately 70% glutamic acid and 30% aspartic acid. Hence, it can be seen that the inventive copolymer need not necessarily contain a homogeneous and repeating di-peptide, which would result in a 50-50 content of glutamic acid and aspartic acid. Rather, many variations within this range are contemplated. For example, the preferred embodiment may contain 70% glutamic acid and 30% aspartic acid. However, this range could extend from 50-90% (weight) glutamic acid and 10-50% (weight) aspartic acid.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWMC | Draw Desc | Image

☐ 2. Document ID: US 20030059841 A1

L20: Entry 2 of 52 File: PGPB Mar 27, 2003

DOCUMENT-IDENTIFIER: US 20030059841 A1
TITLE: Methods of using bioelastomers

Detail Description Paragraph:
[0186] (1) Two different classes of polymers have been synthesized that display thermally-responsive behavior in the range of 40-42.degree. C. in physiological saline, a temperature range that is clinically relevant for hyperthermia. The two polymers are (a) an artificial polypeptide, based on a pentapeptide repeat found in elastin, and (b) a poly(NIPAAm/AAm) copolymer. The thermally-responsive behavior is manifested as a solubility-insolubility transition, where the polymer is soluble below the T.sub.I, and insoluble above the T.sub.I.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWMC | Draw Desc | Image

☐ 3. Document ID: US 20030059840 A1

L20: Entry 3 of 52 File: PGPB Mar 27, 2003

DOCUMENT-IDENTIFIER: US 20030059840 A1
TITLE: Methods of using bioelastomers

Detail Description Paragraph:
[0185] (1) Two different classes of polymers have been synthesized that display thermally-responsive behavior in the range of 40-42.degree. C. in physiological saline, a temperature range that is clinically relevant for hyperthermia. The two polymers are (a) an artificial polypeptide, based on a pentapeptide repeat found in elastin, and (b) a poly(NIPAAm/AAm) copolymer. The thermally-responsive behavior is manifested as a solubility-insolubility transition, where the polymer is soluble below the T.sub.I, and insoluble above the T.sub.I.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 4. Document ID: US 20030026840 A1

L20: Entry 4 of 52 File: PGPB Feb 6, 2003

DOCUMENT-IDENTIFIER: US 20030026840 A1
TITLE: Combinations for introducing nucleic acids into cells

Detail Description Paragraph:
[0152] a) The copolymer P3YE5C was prepared from fraction 3 (22.800 Da) of product (4) and purified peptide. As a product a compound was obtained with an apparent molecular weight of 35.000 Da. With respect to the molecular weight of the peptide and the copolymer backbone used, this means a degree of polymerization of p=6 (6 repeating units).

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 5. Document ID: US 20020155992 A1

L20: Entry 5 of 52 File: PGPB Oct 24, 2002

DOCUMENT-IDENTIFIER: US 20020155992 A1
TITLE: Poly (dipeptide) as a drug carrier

Detail Description Paragraph:
[0137] The following sections report on preferred, but not limiting, embodiments for synthesizing the inventive polyglutamic acid/aspartic acid (or poly glutamic acid/alanine, or poly glutamic acid/asparagine, or poly glutamic acid/glutamine, or poly glutamic acid/glycine) copeptide and properties of such a peptide. In general, the inventive poly(glutamic/aspartic acid) di-peptide is abiodegradablepolymer. As described below, the polypeptide may be synthesized in a conjugate form with a particular drug in order to enhance the solubility and/or in vivo deliverability of such drug. In such an instance, it may be considered as a "propolymeric drug delivery vehicle" and be prepared in a powder form. By adding sterile to the powder, the drug conjugate can then be used for interveneous administration. The inventive polymer-drug conjugates provide sustained relief properties and prolong blood circulation time which are more effective and less toxic than using, for example, unconjugated drug alone. As

discussed above, examples of drugs which can be conjugated to the inventive conjugating include, in a non-limiting sense, paclitaxel, epipodophyllotoxin, vincristine, docetaxel, daunomycin, doxorubicin, mitoxantrone, topotecan, bleomycin, gemcitabine, fludarabine and 5-FUDR In one embodiment, for example, the inventive poly(glutamate/aspartate) polypeptide is approximately 26,000 to 30,000 dalton molecular weight containing approximately 70% glutamic acid and 30% aspartic acid. Hence, it can be seen that the inventive copolymer need not necessarily contain a homogeneous and repeating dipeptide, which would result in a 50-50 content of glutamic acid and aspartic acid. Rather, many variations within this range are contemplated. For example, the preferred embodiment may contain 70% glutamic acid and 30% aspartic acid. However, this range could extend from 50-90% (weight) glutamic acid and 10-50% (weight) aspartic acid.

☐ 6. Document ID: US 20020132766 A1

L20: Entry 6 of 52 File: PGPB Sep 19, 2002

DOCUMENT-IDENTIFIER: US 20020132766 A1
TITLE: Design, preparation, and properties of antibacterial beta-peptides

Detail Description Paragraph:
[0058] Each triplet need not be the same. A peptide could be a homopolymer of triplets each having the same pattern. Alternatively, a peptide could be a copolymer of repeating patterns of different triplets. For example, two triplets having different amino acid sequence from each other could be repeated in the peptide. It can be seen that the peptide could include any repeating pattern of triplets.

☐ 7. Document ID: US 20020068304 A1

L20: Entry 7 of 52 File: PGPB Jun 6, 2002

DOCUMENT-IDENTIFIER: US 20020068304 A1
TITLE: Bioelastomer nanomachines and biosensors

Detail Description Paragraph:
[0090] Particularly preferred bioelastic materials are those that contain at least one at least one repeating pentapeptide having the formula GX.sup.3GX.sup.4P (SEQ ID NO:10), more preferably at least one GVGVP (SEQ ID NO:1) or GVGIP (SEQ ID NO:2) pentapeptide, which can also be referred to as a-(GVGVP).sub.n-b or a-(GVGIP).sub.n-b bioelastomers, where "n" is an integer from 1 to 10,000, preferably 3 to 700, and "a" and "b" are polytetrapeptides, polypentapeptides, nonapeptides or copolymers thereof.

☐ 8. Document ID: US 20010041189 A1

L20: Entry 8 of 52 File: PGPB Nov 15, 2001

DOCUMENT-IDENTIFIER: US 20010041189 A1
TITLE: POLY(DIPEPTIDE) AS A DRUG CARRIER

Detail Description Paragraph:
[0127] In one embodiment, for example, the inventive poly(glutamate/aspartate) polypeptide is approximately 26,000 to 30,000 dalton molecular weight containing approximately 70% glutamic acid and 30% aspartic acid. Hence, it can be seen that the inventive copolymer need not necessarily contain a homogeneous and repeating dipeptide, which would result in a 50-50 content of glutamic acid and aspartic acid. Rather, many variations within this range are contemplated. For example, the preferred embodiment may contain 70% glutamic acid and 30% aspartic acid. However, this range could extend from 50-90% (weight) glutamic acid and 10-50% (weight) aspartic acid.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 9. Document ID: US 20010038830 A1

L20: Entry 9 of 52 File: PGPB Nov 8, 2001

DOCUMENT-IDENTIFIER: US 20010038830 A1
TITLE: N,O-amidomalonate platinum complexes

Summary of Invention Paragraph:
[0033] This invention comprises a method enhancing the therapeutic index of a platinum diamine compound when the compound is used for treating a tumor by parenterally administering a pharmaceutically acceptable solution containing the compound to a subject, comprising prior to said administering, complexing the platinum compound with a copolymer composed of an N-alkyl acrylamide first repeat unit and a second repeat unit having an oligopeptide side chain having an amidomalonate end group complexing via N,O linkages with said platinum compound.

Summary of Invention Paragraph:
[0034] From another view, this invention involves a method of improving the stability of a platinum diamine compound comprising complexing the compound with a copolymer composed of an N-alkyl acrylamide first repeat unit and a second repeat unit having an oligopeptide side chain having an amidomalonate end group complexing with said platinum compound through an O,N-linkage.

Summary of Invention Paragraph:
[0046] In another aspect, the invention includes a method of enhancing the therapeutic index of a platinum compound, when the compound is used for treating a tumor by administering parenterally a pharmaceutically acceptable solution containing the compound to a subj ect. The method includes, prior to administering the compound, complexing the platinum compound with a copolymer composed of an N-alkyl acrylamide first repeat unit and a second repeat unit having an oligopeptide side chain which terminates in a proximal end group capable of complexing with the platinum compound.

Summary of Invention Paragraph:
[0047] In another aspect, the invention includes a method of improving the solubility and/or

stability of a platinum compound by complexing the compound with a copolymer composed of an N-alkyl acrylamide first repeat unit and a second repeat unit having an oligopeptide side chain which terminates in a proximal end group capable of complexing with said platinum compound. The polymer-platinum complex is more soluble and/or more stable under physiological conditions than non-complex platinum compounds. A preferred platinum complex is bound through--and O-- of most preferably an amidomalonate residue connected to a biodegradable linkage to a polymer.

CLAIMS:

33. A method of enhancing the therapeutic index of a platinum diamine compound when the compound is used for treating a tumor by parenterally administering a pharmaceutically acceptable solution containing the compound to a subject, comprising: prior to said administering, complexing the platinum compound with a copolymer composed of an N-alkyl acrylamide first repeat unit and a second repeat unit having an oligopeptide side chain having an amidomalonate end group complexing via N,O linkages with said platinum compound.

34. A method of improving the stability of a platinum diamine compound comprising complexing the compound with a copolymer composed of an N-alkyl acrylarniide first repeat unit and a second repeat unit having an oligopeptide side chain having an amidomalonate end group complexing with said platinum compound through an O,N-linkage.

☐ 10. Document ID: US 6692734 B2

L20: Entry 10 of 52 File: USPT Feb 17, 2004

DOCUMENT-IDENTIFIER: US 6692734 B2
TITLE: N,O-amidomalonate platinum complexes

Brief Summary Text (35):
This invention comprises a method enhancing the therapeutic index of a platinum diamine compound when the compound is used for treating a tumor by parenterally administering a pharmaceutically acceptable solution containing the compound to a subject, comprising prior to said administering, complexing the platinum compound with a copolymer composed of an N-alkyl acrylamide first repeat unit and a second repeat unit having an oligopeptide side chain having an amidomalonate end group complexing via N,O linkages with said platinum compound.

Brief Summary Text (36):
From another view, this invention involves a method of improving the stability of a platinum diamine compound comprising complexing the compound with a copolymer composed of an N-alkyl acrylamide first repeat unit and a second repeat unit having an oligopeptide side chain having an amidomalonate end group complexing with said platinum compound through an O,N-linkage.

Brief Summary Text (48):
In another aspect, the invention includes a method of enhancing the therapeutic index of a platinum compound, when the compound is used for treating a tumor by administering parenterally a pharmaceutically acceptable solution containing the compound to a subject. The method includes, prior to administering the compound, complexing the platinum compound with a copolymer composed of an N-alkyl acrylamide first repeat unit and a second repeat unit having an oligopeptide side chain which terminates in a proximal end group capable of complexing with the platinum compound.

Brief Summary Text (49):
In another aspect, the invention includes a method of improving the solubility and/or stability of a platinum compound by complexing the compound with a copolymer composed of an N-alkyl acrylamide first repeat unit and a second repeat unit having an oligopeptide side chain which terminates in a proximal end group capable of complexing with said platinum compound. The polymer-platinum complex is more soluble and/or more stable under physiological conditions than non-complex platinum compounds. A preferred platinum complex is bound through--and O- of most preferably an amidomalonate residue connected to a biodegradable linkage to a polymer.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 11. Document ID: US 6677431 B2

L20: Entry 11 of 52 File: USPT Jan 13, 2004

DOCUMENT-IDENTIFIER: US 6677431 B2
TITLE: Design, preparation, and properties of antibacterial .beta.-peptides

Detailed Description Text (21):
Each triplet need not be the same. A peptide could be a homopolymer of triplets each having the same pattern. Alternatively, a peptide could be a copolymer of repeating patterns of different triplets. For example, two triplets having different amino acid sequence from each other could be repeated in the peptide. It can be seen that the peptide could include any repeating pattern of triplets.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 12. Document ID: US 6582926 B1

L20: Entry 12 of 52 File: USPT Jun 24, 2003

DOCUMENT-IDENTIFIER: US 6582926 B1
TITLE: Methods of using bioelastomers

Detailed Description Text (128):
(1) Two different classes of polymers have been synthesized that display thermally-responsive behavior in the range of 40-42.degree. C. in physiological saline, a temperature range that is clinically relevant for hyperthermia. The two polymers are (a) an artificial polypeptide, based on a pentapeptide repeat found in elastin, and (b) a poly(NIPAAm/AAm) copolymer. The thermally-responsive behavior is manifested as a solubility-insolubility transition, where the polymer is soluble below the T.sub.I, and insoluble above the T.sub.I.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 13. Document ID: US 6448344 B1

L20: Entry 13 of 52 File: USPT Sep 10, 2002

DOCUMENT-IDENTIFIER: US 6448344 B1
TITLE: Functional polymers bearing non-metal oxyacid derivatives on dimethylene spaces

Abstract Text (1):
A functional polymer having active and stable functional groups, for separation or reactive processes in chemical manufacture or analysis, bears nonmetal oxyacid derivatives on dimethylene spacers; a method of preparation is from pre-existing polymers comprising polymeric 1-(vinylphenyl)ethylene repeat units, including radial copolymers of divinylbenzene, by treating with HX(O).sub.m R.sup.1.sub.n R.sup.2 in presence of free radicals; another method of preparation is by treating a polymer comprising repeat units of the form --CH[Ph--CH.sub.2 CH.sub.2 --X(O).sub.m R.sup.1.sub.n R.sup.2]--CH.sub.2 -- where X is of lower oxidation state, with oxidizing agent so as to oxidize X to a higher oxidation state; another method of preparation is to exchange one or both of R.sup.1 and R.sup.2 substituents in --CH[Ph--CH.sub.2 CH.sub.2 --X(O).sub.m R.sup.1.sub.n R.sup.2]--CH.sub.2 -- with other substituents; other functional groups may be present; the functional polymer comprises repeat units of the form --CH[Ph--CH.sub.2 CH.sub.2 --X(O).sub.m R.sup.1.sub.n R.sup.2]--CH.sub.2 --, in which X may be S with m=2 and n=0, or P with m=1 and n=1, R.sup.1 may be Cl, Br, O--, OH, R.sup.3, OR.sup.3, NH.sub.2, NHR.sup.3, NR.sup.3 R.sup.4 and NR.sup.5 R.sup.6, and R.sup.2 may be Cl, Br, O--, OH, OR.sup.7, NH.sub.2, NHR.sup.7, NR.sup.7 R.sup.8 and NR.sup.9 R.sup.10, wherein R.sup.3, R.sup.4, R.sup.7, and R.sup.8 are selected from methyl, ethyl, n-propyl, i-propyl, n-butyl, i-butyl, s-butyl, t-butyl, 2-ethylhexyl, hexadecyl, 2-chloroethyl, 2-bromoethyl, 2,2,2-trifluoroethyl, 2-hydroxyethyl, 2-butoxyethyl, 2-aminoethyl, cyclohexyl, phenyl, benzyl, 4-nitrobenzyl, tolyl, a polypeptide, a polysaccharide and a polynucleotide, and R.sup.5, R.sup.6, and R.sup.9 and R.sup.10 are selected from cyclic --(CH.sub.2).sub.q -- wherein q is selected from 2 to 5; polymer-bound functional groups are afforded that are sulfonic acid, sulfonate salt, sulfonate ester, sulfonamide, sulfonyl halide, phosphonic acid, phosphonate salt, phosphonyl halide, phosphonate ester or phosphonamide, or combinations thereof.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWMC | Draw Desc | Image

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☐ 14. Document ID: US 6127166 A

L20: Entry 14 of 52 File: USPT Oct 3, 2000

DOCUMENT-IDENTIFIER: US 6127166 A
TITLE: Molluscan ligament polypeptides and genes encoding them

Brief Summary Text (34):
The invention also features a biomaterial containing an abductin polypeptide, a fusion protein containing an abductin polypeptide and a fibroin polypeptide, or a copolymer containing multiple copies of an abductin polypeptide and multiple copies of a fibroin polypeptide. In the copolymer, the abductin polypeptide can be full-length abductin or a glycine-rich repeat sequence from abductin and the fibroin polypeptide can be full-length fibroin or a fragment of full-length fibroin. These biomaterials can be used in the manufacture, for example, of fabrics woven from threads containing the described biomaterials. Alternatively, the fabric is not woven, e.g., made of non-woven filaments, or extruded or pressed into sheets rather than filaments or threads. Methods of making threads and fabrics from synthetic polymers are known in the art.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWMC | Draw Desc | Image

☐ 15. Document ID: US 5965118 A

L20: Entry 15 of 52 File: USPT Oct 12, 1999

DOCUMENT-IDENTIFIER: US 5965118 A
TITLE: Polymer-platinum compounds

Brief Summary Text (39):
In another aspect, the invention includes a method of enhancing the therapeutic index of a platinum compound, when the compound is used for treating a tumor by administering parenterally a pharmaceutically acceptable solution containing the compound to a subject. The method includes, prior to administering the compound, complexing the platinum compound with a copolymer composed of an N-alkyl acrylamide first repeat unit and a second repeat unit having an oligopeptide side chain which terminates in a proximal end group capable of complexing with the platinum compound.

Brief Summary Text (40):
In another aspect, the invention includes a method of improving the solubility and/or stability of a platinum compound by complexing the compound with a copolymer composed of an N-alkyl acrylamide first repeat unit and a second repeat unit having an oligopeptide side chain which terminates in a proximal end group capable of complexing with said platinum compound. The polymer-platinum complex is more soluble and/or more stable under physiological conditions than non-complex platinum compounds.

CLAIMS:

22. A method of enhancing the therapeutic index of a platinum compound, when the compound is used for treating a tumor by administering parenterally a pharmaceutically acceptable solution containing the compound to a subject, comprising

prior to said administering, complexing the platinum compound with a copolymer composed of an N-alkyl acrylamide first repeat unit and a second repeat unit having an oligopeptide side chain which terminates in a proximal end group capable of complexing with said platinum compound.

23. A method of improving the solubility of a platinum compound comprising complexing the compound with a copolymer composed of an N-alkyl acrylamide first repeat unit and a second repeat unit having an oligopeptide side chain which terminates in a proximal end group capable of complexing with said platinum compound.

24. A method of improving the stability of a platinum compound comprising complexing the compound with a copolymer composed of an N-alkyl acrylamide first repeat unit and a second repeat unit having an oligopeptide side chain which terminates in a proximal end group capable of complexing with said platinum compound.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw. Desc | Image

☐ 16. Document ID: US 5853713 A

L20: Entry 16 of 52 File: USPT Dec 29, 1998

DOCUMENT-IDENTIFIER: US 5853713 A
TITLE: Biologically compatible linear block copolymers of polyalkylene oxide and peptide units

Brief Summary Text (9):
However, none of these references suggests a linear block copolymer having repeating units of an alkylene oxide linked to repeating units of a peptide through a linking group formed by the reaction of an amine precursor and an epoxide precursor. Moreover, the prior art teaches that crosslinking (via amino acid side chains) often frustrates the linear copolymerization often sought. The invention described herein advantageously avoids such crosslinking.

Brief Summary Text (11):
The invention concerns a linear block copolymer comprising single or repeating units of poly (alkylene oxide) (PAG) linked to units of peptide. The copolymer can be tailored to produce water-soluble polymers which are stable in the blood circulation but ultimately will be degraded to allow more facile excretion of low molecular weight PAG derivatives in the urine.

☐ 17. Document ID: US 5717065 A

L20: Entry 17 of 52 File: USPT Feb 10, 1998

DOCUMENT-IDENTIFIER: US 5717065 A
TITLE: Synthetic polypeptides and antibodies related to epstein-barr virus nuclear antigen

Detailed Description Text (27):
Thus, even though the polypeptide denominated P62 (Table 1) that contains the sequentially repeating sequence --Ala--Gly--Ala--Gly--Gly--Gly--Ala--Gly--Gly--, that polypeptide additionally contains an -Ala-Gly- peptide at the carboxyl-terminus. As a consequence, there is no amino acid residue sequence that repeats throughout the polypeptide, and polypeptide P62 must be viewed as being a random copolymer and not a homoblock copolymer as are the poly (Ala.sub.x -Gly.sub.y) materials prepared by Bracket al. or the poly(Ser-Gly) materials prepared by Anderson et al. whose identical blocks of particular amino acid residue sequences repeat throughout the length of their polymers.

Detailed Description Text (65):
The present invention also contemplates a multimeric polypeptide (multimer) containing a plurality of joined random copolymer polypeptide repeating units wherein at least one of the repeating units is a polypeptide as described herein.

Detailed Description Text (70):
Alternatively, multimers can be prepared as a polymer of random copolymer polypeptides used as monomers. As used herein, the term "polymer" in its various grammatical forms is defined as a type of multimer that contains a plurality of random copolymer polypeptide repeating units that are joined together by other than peptide bonds.

Detailed Description Text (239):
The polymer (synthetic multimet) so prepared contains a plurality of the synthetic, random copolymer polypeptide repeating units that are bonded together by oxidizing cysteine (cystine) residues. Such polymers typically contain their polypeptide repeating units bonded together in a head-to-tail manner as well as in head-to-head and tail-to-tail manners; i.e., the amino-termini of two polypeptide repeating units may be bonded together through a single cystine residue as may two carboxyl-termini since the linking groups at both polypeptide termini are identical.

☐ 18. Document ID: US 5618528 A

L20: Entry 18 of 52 File: USPT Apr 8, 1997

DOCUMENT-IDENTIFIER: US 5618528 A
TITLE: Biologically compatible linear block copolymers of polyalkylene oxide and peptide units

Brief Summary Text (9):
However, none of these references suggests a linear block copolymer having repeating units of an alkylene oxide linked to repeating units of a peptide through a linking group formed by the reaction of an amine precursor and an epoxide precursor. Moreover, the prior art teaches that crosslinking (via amino acid side chains) often frustrates the linear copolymerization often sought. The invention described herein advantageously avoids such crosslinking.

Brief Summary Text (11):
The invention concerns a linear block copolymer comprising single or repeating units of poly (alkylene oxide) (PAG) linked to units of peptide. The copolymer can be tailored to produce water-soluble polymers which are stable in the blood circulation but ultimately will be degraded to allow more facile excretion of low molecular weight PAG derivatives in the urine.

☐ 19. Document ID: US 5583211 A

L20: Entry 19 of 52 File: USPT Dec 10, 1996

DOCUMENT-IDENTIFIER: US 5583211 A
TITLE: Surface activated organic polymers useful for location - specific attachment of nucleic acids, peptides, proteins and oligosaccharides

Detailed Description Text (58):
The surface activated, organic polymers can also be utilized for cell adhesion and cell growth/propagation for example, in devices used for mammalian cell culture, artificial skin grafts and prosthetic devices exhibiting tissue and blood compatability. For example, bioreactive peptides directed to specific cell recognition domains can be synthesized onto the disclosed polymers, and samples comprising a variety of cells can be applied thereto, whereby those cells comprising the recognition domains can selectively attach thereto. Yamada, K. M., "Adhesion Recognition Peptides," J. Bio. Chem. 266:20 12809-12812 (1991), describes a variety of bioreactive peptides and the cells comprising recognition domains specific for such domains. For example, the adhesive glycoprotein fibronectin is involved in a variety of biological processes, particularly in mediating cell attachment and cell migration. Fibronectin is bound by several cell surface receptors; peptide sequences of fibronectin which are recognized by such receptors include Arg-Gly-Asp ("RGD") and Leu-Asp-Val ("LDV"). Thus, a series of biopolymers comprising one or more RGD peptides can be synthesized onto the disclosed polymers to, e.g., mediate cell attachment thereto. For example, Pierschbacker and Ruoslahti, Nature 309:30-33, 1984 (and cited references), first isolated and characterized a peptic digest fragment of fibronectin containing the cell attachment domain. A 30-amino acid synthetic peptide was prepared which carried the cell attachment promoting activity. The domain was

further delineated to a tetrapeptide (RGDS) that promoted the attachment of rat kidney fibroblasts when attached via a 6-carbon atom spacer arm to Sepharose beads but not when the RGDS tetrapeptide was coupled to protein-coated plastic plates. The authors suggested that this lack of activity might be due to a decrease in accessibility of cells to the attachment domain or because of poor coupling efficiency to the protein-coated plastic surface. To alleviate this problem, Cappello and Crissman, Polymer Preprints 31: 193-194, 1990, utilizing recombinant genetics, inserted a 10-amino acid sequence of fibronectin that contained the RGD domain into a segment of the amino acid sequence encoding the crystalline region of the Bombyx mori silk fibroin protein. A high molecular weight copolymer SLP-F containing repeat sequences of the RGD recombinant peptide was immobilized onto nitrocellulose filters and promoted the attachment of african green monkey kidney epithelial cells. The supports disclosed herein can be utilized in an efficient manner to achieve these types of end-results.

☐ 20. Document ID: US 5554501 A

L20: Entry 20 of 52 File: USPT Sep 10, 1996

DOCUMENT-IDENTIFIER: US 5554501 A
TITLE: Biopolymer synthesis using surface activated biaxially oriented polypropylene

Detailed Description Text (69):
The surface activated, organic polymers can also be utilized for cell adhesion and cell growth/propagation for example, in devices used for mammalian cell culture, artificial skin grafts and prosthetic devices exhibiting tissue and blood compatability. For example, bioreactive peptides directed to specific cell recognition domains can be synthesized onto the disclosed polymers, and samples comprising a variety of cells can be applied thereto, whereby those cells comprising the recognition domains can selectively attach thereto. Yamada, K. M., "Adhesion Recognition Peptides," J. Bio. Chem. 266:20 12809-12812 (1991), describes a variety of bioreactive peptides and the cells comprising recognition domains specific for such domains. For example, the adhesive glycoprotein fibronectin is involved in a variety of biological processes, particularly in mediating cell attachment and cell migration. Fibronectin is bound by several cell surface receptors; peptide sequences of fibronectin which are recognized by such receptors include Arg-Gly-Asp ("RGD") and Leu-Asp-Val ("LDV"). Thus, a series of biopolymers comprising one or more RGD peptides can be synthesized onto the disclosed polymers to, e.g., mediate cell attachment thereto. For example, Pierschbacker and Ruoslahti, Nature 309:30-33, 1984 (and cited references), first isolated and characterized a peptic digest fragment of fibronectin containing the cell attachment domain. A 30-amino acid synthetic peptide was prepared which carried the cell attachment promoting activity. The domain was further delineated to a tetrapeptide (RGDS) that promoted the attachment of rat kidney fibroblasts when attached via a 6-carbon atom spacer arm to Sepharose beads but not when the RGDS tetrapeptide was coupled to protein-coated plastic plates. The authors suggested that this lack of activity might be due to a decrease in accessibility of cells to the attachment domain or because of poor coupling efficiency to the protein-coated plastic surface. To alleviate this problem, Cappello and Crissman, Polymer Preprints 31: 193-194, 1990, utilizing recombinant genetics, inserted a 10-amino acid sequence of fibronectin that contained the RGD domain into a segment of the amino acid sequence encoding the crystalline region of the Bombyx mori silk fibroin protein. A high molecular weight copolymer SLP-F containing repeat sequences of the RGD recombinant peptide was immobilized onto nitrocellulose filters and promoted the attachment of african green monkey kidney epithelial cells. The supports disclosed herein can be utilized in an efficient manner to achieve these types of end-results.

☐ 21. Document ID: US 5336256 A

L20: Entry 21 of 52 File: USPT Aug 9, 1994

DOCUMENT-IDENTIFIER: US 5336256 A
TITLE: Elastomeric polypeptides as vascular prosthetic materials

Detailed Description Text (176):
The elasticity-modifying hexapeptide segments are believed to operate much in the same way as the hard segments in segmented polyurethanes. For example, when the polyhexapeptide, specifically (VAPGVG).sub.n, is dissolved in water at 4.degree. C. and the temperature is raised, aggregation occurs over a relatively narrow temperature range and that range shifts to lower temperatures as the concentration is raised. The aggregation of the polyhexapeptide, in contrast to that of the polypentapeptide, is irreversible in water. The aggregates can be redissolved in trifluoroethanol-water mixtures and lyophilyzed to regain water solubility; i.e., the heat-illicited aggregation of the polyhexapeptide is not a true irreversible process. This is thought to be due to the more rigid structure of the polyhexapeptide wherein on association there is an interlocking of hydrophobic ridges. Thus, in a copolymer comprising repeating hexapeptides and repeating pentapeptides, it appears that the hexapeptide repeats tend to associate selectively (i.e., to cluster) and that these clusters of stiffer hexapeptide units, separated by softer polypentapeptide or polytetrapeptide segments, impart additional rigidity to the composite material and result in an increased modulus of elasticity and increased tensile strength. This is quite analogous to the hard and soft segments of segmented polyurethanes, such as are described in Ulrich et al, in Synthetic Biomedical Polymers: Concepts and Applications, Szycher and Robinson, Eds. Technomic Publishing Co., Inc., West Port, Conn., 29-38 (1980).

☐ 22. Document ID: US 5250516 A

L20: Entry 22 of 52 File: USPT Oct 5, 1993

DOCUMENT-IDENTIFIER: US 5250516 A
TITLE: Bioelastomeric materials suitable for the protection of burn areas or the protection of wound repair sites from the occurrence of adhesions

Detailed Description Text (175):
The elasticity-modifying hexapeptide segments are believed to operate much in the same way as the hard segments in segmented polyurethanes. For example, when the polyhexapeptide, specifically (VAPGVG).sub.n, is dissolved in water at 4.degree. C. and the temperature is raised, aggregation occurs over a relatively narrow temperature range and that range shifts to lower temperatures as the concentration is raised. The aggregation of the polyhexapeptide, in contrast to that of the polypentapeptide, is irreversible in water. The aggregates can be redissolved in trifluoroethanol-water mixtures and lyophilyzed to regain water solubility; i.e., the heat-illicited aggregation of the polyhexapeptide is not a true irreversible process. This is thought to be due to more rigid structure of the polyhexapeptide wherein on association there is an interlocking of hydrophobic ridges. Thus, in a copolymer comprising repeating

hexapeptides and repeating pentapeptides, it appears that the hexapeptide repeats tend to associate selectively (i.e., to cluster) and that these clusters of stiffer hexapeptide units, separated by softer polypentapeptide or polytetrapeptide segments, impart additional rigidity to the composite material and result in an increased modulus of elasticity and increased tensile strength. This is quite analogous to the hard and soft segments of segmented polyurethanes, such as are described in Ulrich et al, in Synthetic Biomedical Polymers: Concepts and Applications, Szycher and Robinson, Eds. Technomic Publishing Co., Inc., West Port, Conn., 29-38 (1980).

☐ 23. Document ID: US 5247067 A

L20: Entry 23 of 52 File: USPT Sep 21, 1993

DOCUMENT-IDENTIFIER: US 5247067 A
TITLE: Peptide and its use

Detailed Description Text (14):
Production of the peptide of the present invention by the solid phase synthesis method is carried out, for example, by repeating the process of binding an amino acid corresponding to the C-terminal of the desired peptide or the amide thereof to a polymer insoluble in reaction solvent such as styrene-divinylbenzene copolymer via the .alpha.--COO-- group or .alpha.--CONH-- group obtained by eliminating the hydrogen atom from the .alpha.--COOH group or .alpha.--CONH.sub.2 group contained therein and subsequently condensing and binding the corresponding amino acid or peptide fragment to the amino acid or its amide in the direction of the N-terminal of the desired peptide after protecting the functional group other than the .alpha.--COOH group contained in the amino acid or peptide fragment such as .alpha.-amino acid and the process of eliminating the protective group bound to the amino group which forms the peptide linkage, such as .alpha.-amino group, in the bound amino acid or peptide fragment to elongate the peptide chain to a peptide chain corresponding to the desired peptide, then eliminating the peptide chain from the polymer and removing the protective group from the protected functional group to yield the desired peptide, which is then purified. Here, it is preferable from the viewpoint of suppression of side reaction that the elimination of the peptide chain from the polymer and the removal of the protective group be conducted simultaneously using hydrogen fluoride. Also, it is efficient to purify the obtained peptide by reversed phase liquid chromatography.

☐ 24. Document ID: US 5241048 A

L20: Entry 24 of 52 File: USPT Aug 31, 1993

DOCUMENT-IDENTIFIER: US 5241048 A
TITLE: Organic syntheses employing supercritical carbon dioxide as a reaction solvent

Brief Summary Text (20):
Supercritical carbon dioxide can be used as a reaction solvent for processes for polymerizing

N-carboxylanhydride or its derivatives to form peptide homopolymer and copolymers having repeating .alpha.-amino acid units. ##STR5## In the second reaction, the "R" side-chain will vary depending upon R.sup.1 or R.sup.2 and the relative proportions of co-monomers. Terpolyamides and higher polymers can be obtained through use of three or more starting anhydride monomers.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWMC | Draw Desc | Image

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☐ 25. Document ID: US 5185147 A

L20: Entry 25 of 52 File: USPT Feb 9, 1993

DOCUMENT-IDENTIFIER: US 5185147 A
**** See image for Certificate of Correction ****
TITLE: Short polypeptide sequences useful in the production and detection of antibodies against human immunodeficiency virus

Detailed Description Text (53):
The polymer so prepared contains a plurality of the synthetic, random copolymer polypeptide repeating units that are bonded together by oxidizing cysteine (cystine) residues. Such polymers typically contain their polypeptide repeating units bonded together in a head-to-tail manner as well as in head-to-head and tail-to-tail manners; i.e., the amino-termini of two polypeptide repeating units may be bonded together through a a single cystine residue as may two carboxyl-termini since the linking groups at both polypeptide termini are identical.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWMC | Draw Desc | Image

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☐ 26. Document ID: US 5143726 A

L20: Entry 26 of 52 File: USPT Sep 1, 1992

DOCUMENT-IDENTIFIER: US 5143726 A
**** See image for Certificate of Correction ****
TITLE: T cell epitopes of the hepatitis B virus nucleocapsid protein

Detailed Description Text (93):
The polymer so prepared contains a plurality of the synthetic, random copolymer polypeptide repeating units that are bonded together by oxidized cysteine (cystine) residues.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWMC | Draw Desc | Image

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☐ 27. Document ID: US 5132402 A

L20: Entry 27 of 52 File: USPT Jul 21, 1992

DOCUMENT-IDENTIFIER: US 5132402 A
TITLE: Adsorbent, method for production thereof, and method for use thereof

Brief Summary Text (37):
Now, the synthesis of a peptide (I) in accordance with the solid-phase synthesis method will be described below. This synthesis is accomplished by sequentially repeating an operation of binding through condensation to such a polymer insoluble in a reaction solvent as a styrene-divinylbenzene copolymer having bonded thereto an acyloxy group or an acylamino group obtained by removing a hydrogen atom respectively from an .alpha.-carboxyl group or an .alpha.-cabamoyl group possessed by an amino acid or an amino acid amide corresponding to the C terminal of the peptide (I) aimed at the corresponding component amino acids in the order of their occurrence in the direction of the N terminal of the peptide, with such a functional group as .alpha.-amino group other than the .alpha.-carboxyl group possessed by the relevant amino acid kept in a protected form, and an operation of removing a protective group from the amino group to be caused to form the peptide bond, such as .alpha.-amino group, which group is possessed by the bound amino acid, thereby attaining gradual growth of a peptide chain and eventually completing a peptide chain corresponding to the peptide aimed at, and separating the peptide chain from the polymer and, at the same time, removing the protecting groups from the protected functional groups and consequently obtaining the peptide, and finally purifying the peptide. In this case, for the sake of precluding otherwise possible occurrence of side reactions, the separation of the peptide chain from the polymer and the removal of the protecting groups are desired to be simultaneously effected by the use of hydrogen fluoride. The purification of the peptide (I) so obtained can be effectively attained by reverse-phase liquid chromatography.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 28. Document ID: US 5126147 A

L20: Entry 28 of 52 File: USPT Jun 30, 1992

DOCUMENT-IDENTIFIER: US 5126147 A
TITLE: Sustained release dosage form

Detailed Description Text (8):
The procedure of Example 1 is repeated, except that Timothy grass (Phleum pratense) allergen is substituted for short ragweed, diketene acetal-diol condensates (diketene acetal 3,9-bis-[methylene]-2,4,8,10-tetraoxaspiro [5,5] undecane condensed with 1,6-hexanediol) is substituted for the (lactide-co-glycolide) copolymer, and an adjuvant (glycodipeptide N-acetyl-muramyl-L-alpha-aminobutyryl-D-isoglutamine) is incorporated into the aqueous phase.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 29. Document ID: US 5122448 A

L20: Entry 29 of 52 File: USPT Jun 16, 1992

DOCUMENT-IDENTIFIER: US 5122448 A
**** See image for Certificate of Correction ****
TITLE: Assay of anti-Epstein-Barr virus nuclear antigen antibodies with synthetic polypeptides

Detailed Description Text (26):
Thus, even though the polypeptide denominated P62 (Table 1) that contains the sequentially repeating sequence -Ala-Gly-Ala-Gly-Gly-Gly-Ala-Gly-Gly-, that polypeptide additionally contains an -Ala-Gly-peptide at the carboxyl-terminus. As a consequence, there is no amino acid residue sequence that repeats throughout the polypeptide, and polypeptide P62 must be viewed as being a random copolymer and not a homoblock copolymer as are the poly(Ala.sub.x -Gly.sub.y) materials prepared by Brack et al. or the poly(Ser-Gly) materials prepared by Anderson et al. whose identical blocks of particular amino acid residue sequences repeat throughout the length of their polymers.

Detailed Description Text (62):
The present invention also contemplates a synthetic multimer containing a plurality of joined synthetic, random copolymer polypeptide repeating units wherein at least one of the repeating units is a polypeptide as described herein.

Detailed Description Text (67):
Alternatively, multimers can be prepared as a polymer of synthetic, random copolymer polypeptides used as monomers. As used herein, the term "polymer" in its various grammatical forms is defined as a type of multimer that contains a plurality of synthetic, random copolymer polypeptide repeating units that are joined together by other than peptide bonds.

Detailed Description Text (226):
The polymer (synthetic multimer) so prepared contains a plurality of the synthetic, random copolymer polypeptide repeating units that are bonded together by oxidizing cysteine (cystine) residues. Such polymers typically contain their polypeptide repeating units bonded together in a head-to-tail manner as well as in head-to-head and tail-to-tail manners; i.e., the amino-termini of two polypeptide repeating units may be bonded together through a single cystine residue as may two carboxyl-termini since the linking groups at both polypeptide termini are identical.

☐ 30. Document ID: US 5116725 A

L20: Entry 30 of 52 File: USPT May 26, 1992

DOCUMENT-IDENTIFIER: US 5116725 A
**** See image for Certificate of Correction ****
TITLE: Assay for Epstein-Barr virus infection with solid phase bound synthetic polypeptides

Detailed Description Text (25):
Thus, even though the polypeptide denominated P62 (Table 1) that contains the sequentially repeating sequence -Ala-Gly-Ala-Gly-Gly-Gly-Ala-Gly-Gly-, that polypeptide additionally contains an -Ala-Gly-peptide at the carboxyl-terminus. As a consequence, there is no amino acid residue sequence that repeats throughout the polypeptide, and polypeptide P62 must be viewed as being a random copolymer and not a homoblock copolymer as are the poly(Ala.sub.x -Gly.sub.y) materials prepared by Brack et al. or the poly(Ser-Gly) materials prepared by Anderson et al. whose identical blocks of particular amino acid residue sequences repeat throughout the length of their polymers.

Detailed Description Text (61):
The present invention also contemplates a synthetic multimer containing a plurality of joined synthetic, random copolymer polypeptide repeating units wherein at least one of the repeating

units is a polypeptide as described herein.

Detailed Description Text (66):
Alternatively, multimers can be prepared as a polymer of synthetic, random copolymer polypeptides used as monomers. As used herein, the term "polymer" in its various grammatical forms is defined as a type of multimer that contains a plurality of synthetic, random copolymer polypeptide repeating units that are joined together by other than peptide bonds.

Detailed Description Text (222):
The polymer (synthetic multimer) so prepared contains a plurality of the synthetic, random copolymer polypeptide repeating units that are bonded together by oxidizing cysteine (cystine) residues. Such polymers typically contain their polypeptide repeating units bonded together in a head-to-tail manner as well as in head-to-head and tail-to-tail manners; i.e., the amino-termini of two polypeptide repeating units may be bonded together through a single cystine residue as may two carboxyl-termini since the linking groups at both polypeptide termini are identical.

☐ 31. Document ID: US RE33897 E

L20: Entry 31 of 52 File: USPT Apr 21, 1992

DOCUMENT-IDENTIFIER: US RE33897 E
TITLE: Synthetic polypeptides and antibodies related to Epstein-Barr virus nuclear antigen

Detailed Description Text (26):
Thus, even though the polypeptide denominated P62 (Table 1) that contains the sequentially repeating sequence -Ala-Gly-Ala-Gly-Gly-Gly-Ala-Gly-Gly-, that polypeptide additionally contains an -Ala-Gly-peptide at the carboxyl-terminus. As a consequence, there is no amino acid residue sequence that repeats tnroughout the polypeptide, and polypeptide P62 must be viewed as being a random copolymer and not a homoblock copolymer as are the poly(Ala.sub.x -Gly.sub.y) materials prepared by Brack et al. or the poly(Ser-Gly) materials prepared by Anderson et al. whose identical blocks of particular amino acid residue sequences repeat throughout the length of their polymers.

Detailed Description Text (71):
The present invention also contemplates a synthetic multimer containing a plurality of joined synthetic, random copolymer polypeptide repeating units wherein at least one of the repeating units is a polypeptide as described herein.

Detailed Description Text (76):
Alternatively, multimers can be prepared as a polymer of synthetic, random copolymer polypeptides used as monomers. As used herein, the term "polymer" in its various grammatical forms is defined as a type of multimer that contains a plurality of synthetic, random copolymer polypeptide repeating units that are joined together by other than peptide bonds.

Detailed Description Text (159):
The polymer (synthetic multimer) so prepared contains a plurality of the synthetic, random copolymer polypeptide repeating units that are bonded together by oxidizing cysteine (cystine) residues. Such polymers typically contain their polypeptide repeating units bonded together in a head-to-tail manner as well as in head-to-head and tail-to-tail manners; i.e., the amino-termini of two polypeptide repeating units may be bonded together through a single cystine residue as may two carboxyl-termini since tne linking groups at both polypeptide termini are identical.

☐ 32. Document ID: US 5089406 A

L20: Entry 32 of 52 File: USPT Feb 18, 1992

DOCUMENT-IDENTIFIER: US 5089406 A
TITLE: Method of producing a gene cassette coding for polypeptides with repeating amino acid sequences

Detailed Description Text (31):
If the cloned bacteria do not produce the polypeptide having the desired length or the desired repeating amino acid sequence, larger DNA fragments coding for an appropriate length polypeptide or one of the appropriate sequence can be obtained by isolation of one or more of the DNA fragment inserts from bacteria harboring a plasmid vector containing such insert using one or a pair of restriction enzymes which only cleave the associated linker DNAs and by oligomerization of such insert DNAs. The techniques for oligomerization and transformation of the newly created larger DNA fragment are obvious extensions of techniques described above in detail. This procedure can be applied to the creation of hybrid DNA fragments containing more than one DNA fragment coding for distinct repeating amino acid sequences. The oligomerization and recloning of DNA fragments can be done several times and can be continued until gene constructs having the described characteristics are formed. For example, individual DNA fragments coding for repeating amino acid sequences (Gly-Pro-Pro) and (Gly-Val-Gly-Val-Pro) can be joined in various recloning procedures to obtain random or alternating block copolymers polypeptides composed of repeating units of these amino acid sequences of various lengths. The sequence (Gly-Pro-Pro)n is an analogue to the eucaryotic protein collagen and may therefore form triple helical macromolecular aggregates and exhibit physical properties of high tensile strength and low elasticity. The sequence (Gly-Val-Gly-Val-Pro)m is a consensus sequence extracted from the known amino acid sequence of the eucaryotic protein elastin and has among its various physical properties the quality of elasticity. A hybrid copolymer polypeptide of these two repeating amino acid sequences might therefore be expected to show degrees of tensile strength and/or elasticity depending upon the nature and size of the larger DNA fragment prepared by the process of this invention which encodes the relevant hybrid copolymer polypeptide.

CLAIMS:

15. A process according to claim 1 which further comprises:

forming a mixture comprising two or more types of gene cassettes, at least one type of said cassette coding for a polypeptide having one or more repeats of amino acid sequences which are different from the amino acid sequences forming the repeats of the polypeptide coded for by at least one other type of gene cassette; and

treating said mixture said ligase to covalently join two or more adjacent gene cassettes so as to maintain the reading frame of the individual cassettes to form a multiple tandem gene cassette which codes for a heteropolypeptide copolymer, said copolymer comprising one or more repeats of more than one type of amino acid sequence, and said copolymer having a molecular weight which is greater than the molecular weight of the polypeptides coded for by individual gene cassettes forming said multiple tandem gene cassette.

16. The method of claim 15 wherein said polypeptide copolymer comprises random or alternating repeats of two amino acid sequences.

18. A method according to claim 15, wherein said joined multiple tandem gene cassettes code for a polypeptide copolymer comprised of random or alternating repeats of two amino acid sequences, one of said sequences being the collagen analogue tripeptide sequence (Gly-Pro-Pro) and one of said sequences being the elastin analogue pentapeptide sequence (Val-Pro-Gly-Val-Gly).

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWMC | Draw Desc | Image

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☐ 33. Document ID: US 5001224 A

L20: Entry 33 of 52 File: USPT Mar 19, 1991

DOCUMENT-IDENTIFIER: US 5001224 A
TITLE: Organic syntheses employing supercritical carbon dioxide as a reaction solvent

Brief Summary Text (22):
Supercritical carbon dioxide can be used as a reaction solvent for processes for polymerizing N-carboxylanhydride or its derivatives to form peptide homopolymer and copolymers having repeating .alpha.-amino acid units. ##STR4## In the second reaction, the "R" side-chain will vary depending upon R.sup.1 or R.sup.2 and the relative proportions of co-monomers. Terpolyamides and higher polymers can be obtained through use of three or more starting anhydride monomers.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWMC | Draw Desc | Image

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☐ 34. Document ID: US 4990336 A

L20: Entry 34 of 52 File: USPT Feb 5, 1991

DOCUMENT-IDENTIFIER: US 4990336 A
TITLE: Sustained release dosage form

Detailed Description Text (8):
The procedure of Example 1 is repeated, except that Timothy grass (Phleum pratense) allergen is substituted for short ragweed, diketene acetal-diol condensates (diketene acetal 3,9-bis-[methylene]-2,4,8,10-tetraoxaspiro [5,5]undecane condensed with 1,6-hexanediol) is substituted for the (lactide-co-glycolide) copolymer, and an adjuvant (glycodipeptide N-acetyl-muramyl-L-alpha-aminobutyryl-D-isoglutamine) is incorporated into the aqueous phase.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWMC | Draw Desc | Image

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☐ 35. Document ID: US 4952395 A

L20: Entry 35 of 52 File: USPT Aug 28, 1990

DOCUMENT-IDENTIFIER: US 4952395 A

**** See image for Certificate of Correction ****
TITLE: Mycobacterial recombinants and peptides

Detailed Description Text (155):
The polymer so prepared contains a plurality of the synthetic, random copolymer polypeptide repeating units that are bonded together by oxidizing cysteine (cystine) residues. Such polymers typically contain their polypeptide repeating units bonded together in a head-to-tail manner as well as in head-to-head and tail-to-tail manners; i.e., the amino-termini of two polypeptide repeating units can be bonded together through a single cystine residue as can two carboxyl-termini since the linking groups at both polypeptide termini are identical.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 36. Document ID: US 4908404 A

L20: Entry 36 of 52 File: USPT Mar 13, 1990

DOCUMENT-IDENTIFIER: US 4908404 A
**** See image for Certificate of Correction ****
TITLE: Synthetic amino acid-and/or peptide-containing graft copolymers

CLAIMS:

25. A water soluble cationic peptide-containing graft copolymer according to claim 24 wherein said monomer repeat units are selected from the group consisting of lysine and allylamine.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 37. Document ID: US 4889917 A

L20: Entry 37 of 52 File: USPT Dec 26, 1989

DOCUMENT-IDENTIFIER: US 4889917 A
**** See image for Certificate of Correction ****
TITLE: Peptide

Brief Summary Text (30):
Now, the manufacture of a peptide represented by the general formula (I) in accordance with the solid-phase method will be described below. This synthesis is accomplished by sequentially repeating an operation of binding through condensation to such a polymer insoluble in a reaction solvent as a styrene-divinylbenzene copolymer having bonded thereto an acyloxy group or an acylamino group obtained by removing a hydrogen atom respectively from an .alpha.-carboxyl group or an .alpha.-cabamoyl group possessed by an amino acid or an amino acid amide corresponding to the C terminal of the peptide aimed at the corresponding component amino acids in the order of their occurrence in the direction of the N terminal of the peptide, with such a functional group as .alpha.-amino group other than the .alpha.-carboxyl group possessed by the

relevant amino acid kept in a protected form, and an operation of removing a protective group from the amino group to be caused to form the peptide bond such as the .alpha.-amino group, which group is possessed by the bound amino acid, thereby attaining gradual growth of a peptide chain and eventually completing a peptide chain corresponding to the peptide aimed at, and separating the peptide chain from the polymer and, at the same time, removing the protecting groups from the protected functional groups and consequently obtaining the peptide, and finally purifying the peptide. In this case, for the sake of precluding otherwise possible occurrence of side reactions, the separation of the peptide chain from the polymer and the removal of the protecting groups are desired to be simultaneously effected by the use of hydrogen fluoride. The purification of the peptide so obtained can be effectively attained by reverse-phase liquid chromatography.

☐ 38. Document ID: US 4889800 A

L20: Entry 38 of 52 File: USPT Dec 26, 1989

DOCUMENT-IDENTIFIER: US 4889800 A
** See image for Certificate of Correction **
TITLE: Synthetic polypeptides and receptor molecules derived therefrom and methods of use

Detailed Description Text (36):
Alternatively, multimers can be prepared as a polymer of synthetic polypeptides used as monomers. As used herein, the term "polymer" in its various grammatical forms is defined as a type of multimer that contains a plurality of synthetic, random copolymer polypeptide repeating units that are joined together by other than peptide bonds.

Detailed Description Text (96):
The polymer (synthetic multimer) so prepared contains a plurality of the synthetic, random copolymer polypeptide repeating units that are bonded together by oxidizing cysteine (cystine) residues. Such polymers typically contain their polypeptide repeating units bonded together in a head-to-tail manner as well as in head-to-head and tail-to-tail manners; i.e., the amino-termini of two polypeptide repeating units may be bonded together through a single cystine residue as may two carboxyl-termini since the linking groups at both polypeptide termini are identical.

☐ 39. Document ID: US 4886663 A

L20: Entry 39 of 52 File: USPT Dec 12, 1989

DOCUMENT-IDENTIFIER: US 4886663 A
TITLE: Synthetic heat-stable enterotoxin polypeptide of Escherichia coli and multimers thereof

Detailed Description Text (20):
It must be understood that the above-described multimeric forms of synthetic ST represent only two of many possible ST multimers. For example, when the multimer referred to as a head-to-tail

multimer or straight-chain homo-oligopolymer having two repeating units is prepared by the oxidation of a 36-residue first polypeptide having an amino acid residue sequence corresponding to that of two ST polypeptides, some polymeric ST having interpolypeptide cystine disulfide bonds (a network homopolymer) is also formed. The repeating units of that network homopolymer contain two of the 18-mer amino acid residue sequences of ST in the repeating unit. A copolymer may be prepared by the oxidation of 18-mer ST first polypeptides along with the above 36-mer multimeric ST first polypeptides to provide a network or cross-linked material whose repeating units have an ST polypeptide amino acid residue sequence.

☐ 40. Document ID: US 4882145 A

L20: Entry 40 of 52 File: USPT Nov 21, 1989

DOCUMENT-IDENTIFIER: US 4882145 A
**** See image for Certificate of Correction ****
TITLE: T cell epitopes of the hepatitis B virus nucleocapsid protein

Detailed Description Text (93):
The polymer so prepared contains a plurality of the synthetic, random copolymer polypeptide repeating units that are bonded together by oxidized cysteine (cystine) residues.

☐ 41. Document ID: US 4870055 A

L20: Entry 41 of 52 File: USPT Sep 26, 1989

DOCUMENT-IDENTIFIER: US 4870055 A
TITLE: Segmented polypeptide bioelastomers to modulate elastic modulus

Brief Summary Text (36):
The elasticity-modifying hexapeptide segments are believed to operate much in the same way as the hard segments in segmented polyurethanes. For example, when polyhexapeptide, specifically (VAPGVG).sub.n, is dissolved in water at 4.degree. C. and the temperature is raised, aggregation occurs over a relatively narrow temperature range and that range shifts to lower temperatures as the concentration is raised. The aggregation of the polyhexapeptide, in contrast to that of the polypentapeptide, is irreversible in water. The aggregates can be redissolved in trifluoroethanol-water mixtures and lyophilyzed to regain water solubility; i.e., the heat-illicited aggregation of the polyhexapeptide is not a true irreversible process. This is thought to be due to more rigid structure of the polyhexapeptide wherein on association there is an interlocking of hydrophobic ridges. Thus, in a copolymer comprising repeating hexapeptides and repeating pentapeptides, it appears that the hexapeptide repeats tend to associate selectively (i.e., to cluster) and that these clusters of stiffer hexapeptide units, separated by softer polypentapeptide or polytetrapeptide segments, impart additional rigidity to the composite material and result in an increased modulus of elasticity and increased tensile strength. This is quite analogous to the hard and soft segments of segmented polyurethanes, such as are described in Ulrich et al., in Synthetic Biomedical Polymers:

Concepts and Applications, Szycher and Robinson, Eds. Technomic Publishing Co., Inc., West Port, Conn., 29-38 (1980).

☐ 42. Document ID: US 4818527 A

L20: Entry 42 of 52 File: USPT Apr 4, 1989

DOCUMENT-IDENTIFIER: US 4818527 A
** See image for Certificate of Correction **
TITLE: T cell epitopes of the hepatitis B virus nucleocapsid protein

Detailed Description Text (89):
The polymer so prepared contains a plurality of the synthetic, random copolymer polypeptide repeating units that are bonded together by oxidized cysteine (cystine) residues.

☐ 43. Document ID: US 4758655 A

L20: Entry 43 of 52 File: USPT Jul 19, 1988

DOCUMENT-IDENTIFIER: US 4758655 A
TITLE: Synthetic polypeptide corresponding to a portion of the heat-labile enterotoxin of escherichia coli, compositions and methods of therewith

Brief Summary Text (29):
A random three-dimensional network copolymer results when oxidative polymerization is carried out using both the above diCys-LT polypeptide and a second polypeptide repeating unit whose amino acid residue sequence corresponds to at least the 14 carboxy-terminal amino acid residues of the E. coli heat-stable enterotoxin (ST polypeptide) discussed hereinbefore. Where network polymers are desired, at least three, and most preferably all six Cys residues of the ST polypeptide are present. It is also preferred that a complete, 18 residue ST polypeptide sequence be utilized.

Detailed Description Text (119):
Another embodiment of a network polymer of this invention contains a plurality of first diCys-LT repeating units, as described before as well as a plurality of second, ST polypeptide repeating units, as described before wherein the ST polypeptide includes at least the 14 carboxy-terminal residues of ST as are illustrated in Formula II, and more preferably the 18 residues shown in Formula VI, and is free from a peptide-bonded LTB polypeptide. The polymer is thus a copolymer whose first-named and second polypeptide repeating units are bonded together by cystine disulfide bonds formed by oxidation of the Cys residues present in each of the repeating units.

Detailed Description Text (124):
A still further group of LTB polypeptide-containing polymers are those copolymers that include repeating units comprised of (i) a diCys-LT polypeptide and (ii) a composite LT/ST polypeptide.

These polymers may be prepared, following the oxidation procedures described hereinafter, by contacting molecular oxygen present in ambient air with an oxidation medium (solution or dispersion) that contains the reduced forms of a diCys-LT polypeptide and a composite LT/ST polypeptide. The repeating units of such a copolymer are also bonded together through cystine disulfide bonds of the oxidized Cys resiudes present in the reduced polypeptides.

Detailed Description Text (125):
These copolymers may contain the LTB polypeptide repeating unit provided by a diCys-LT polypeptide and the LT/ST repeating unit provided by a composite LT/ST polypeptide in a mole ratio of about 0.25:1 to about 5:1. More preferably, the mole ratios utilized are about 1:1 to about 2:1, in the order recited. The mole ratio of total LTB polypeptide-containing repeating units to ST polypeptide repeating units in such a polymer is thus about 1.25:1 to about 6:1, and more preferably about 2:1 to about 3:1.

CLAIMS:

12. The polymer according to claim 9 wherein said polymer is a random network copolymer that further comprises a plurality of second polypeptide repeating units, written from left to right and in the direction from amino-terminus to carboxy-terminus, including a polypeptide sequence corresponding to the formula ##STR8## wherein the Asn and Tyr amino acid residues in parentheses are each an alternative to the immediately preceding amino acid residue in the sequence of the formula;

a, b, c, d, e and f and g, h, i, j, k and 1 are integers each having a value of zero or one, with the proviso that if the value of any of a-f or g-l is zero, the corresponding R.sub.a.sup.1, R.sub.b.sup.2, R.sub.c.sup.3, R.sub.c.sup.4, R.sub.e.sup.5 or R.sub.f.sup.6 group or R.sub.g.sup.7, R.sub.h.sup.8, R.sub.i.sup.9, R.sub.j.sup.10, R.sub.k.sup.11 or R.sub.l.sup.12 group is absent, and when an R.sub.a-f.sup.1-6 -group is absent the sulfur atom or tne Cys residue having an absent R.sub.a-f.sup.1-6 -group forms a cystine disulfide bond, while if the value of any one of a-f or g-l is one, the corresponding R.sub.a-f.sup.1-6 - or R.sub.g-l.sup.7-12 -group is present;

the R.sub.a-f.sup.1-6 -groups when taken individually, are the same or different moieties bonded to the sulfur atom of the Cys residue and are selected from the group consisting of hydrogen, an alkyl group containing 1 to about 4 carbon atoms, and a substituted alkyl group containing 2 to about 4 carbon atoms;

R.sub.g-l.sup.7-12 are the same or different alternative amino acid residues to each immediately preceding Cys residue shown in the formula, and are selected from the group of amino acid residues having neutral a side chain;

at least four of a-f and four of g-l are zero;

said first-named and said second polypeptide repeating units being present in said copolymer at a molar ratio of 1:10 to 10:1; and

said first-named and said second polypeptide repeating units are bonded together by cystine disulfide bonds formed by oxidation of Cys residues present in each of said repeating units.

13. The polymer according to claim 9 wherein said polymer is a random network copolymer that further comprises a plurality of second polypeptide repeating units, written from left to right and in the direction from amino-terminus to carboxy-terminus, corresponding to the formula ##STR9## wherein the Asn and Tyr amino acid residues in parentheses are each an alternative to the immediately preceding amino acid residue in the sequence of the formula;

a, b, c, d, e and f and g, h, i, j, k and 1 are integers each having a value of zero or one, with the proviso that if the value of any of a-f or g-l is zero, the corresponding R.sub.a.sup.1, R.sub.b.sup.2, R.sub.c.sup.3, R.sub.d.sup.4, R.sub.e.sup.5 or R.sub.f.sup.6 group or R.sub.g.sup.7, R.sub.h.sup.8, R.sub.i.sup.9, R.sub.j.sup.10, R.sub.k.sup.11 or R.sub.l.sup.12 group is absent, and when an R.sub.a-f.sup.1-6 -group is absent the sulfur atom

of the Cys residue having an absent R.sub.a-f.sup.1-6 -group forms a cystine disulfide bond, while if the value of any one of a-f or g-l is one, the corresponding R.sub.a-f.sup.1-6 - or R.sub.g-l.sup.7-12 -group is present;

the R.sub.a-f.sup.1-6 -groups when taken individually, are the same or different moieties bonded to the sulfur atom of the Cys residue and are selected from the group consisting of hydrogen, an alkyl group containing 1 to about 4 carbon atoms, and a substituted alkyl group containing 2 to about 4 carbon atoms;

R.sub.g-l.sup.7-12 are the same or different alternative amino acid residues to each immediately preceding Cys residue shown in the formula, and are selected from the group of amino acid residues having a neutral side chain;

at least four of a-f and four of g-l are zero;

said first-named and said second polypeptide repeating units are present in said copolymer at a molar ratio of 1:10 to 10:1; and

said first-named and said second polypeptide repeating units being bonded together by cystine disulfide bonds formed by oxidation of Cys residues present in each of said repeating units.

☐ 44. Document ID: US 4689397 A

L20: Entry 44 of 52 File: USPT Aug 25, 1987

DOCUMENT-IDENTIFIER: US 4689397 A
**** See image for Certificate of Correction ****
TITLE: Synthetic polypeptides for detecting mycobacterial infections

Detailed Description Text (36):
Alternatively, multimers can be prepared as a polymer of synthetic polypeptides used as monomers. As used herein, the term "polymer" in its various grammatical forms is defined as a type of multimer that contains a plurality of synthetic, random copolymer polypeptide repeating units that are joined together by other than peptide bonds.

Detailed Description Text (96):
The polymer (synthetic multimer) so prepared contains a plurality of the synthetic, random copolymer polypeptide repeating units that are bonded together by oxidizing cysteine (cystine) residues. Such polymers typically contain their polypeptide repeating units bonded together in a head-to-tail manner as well as in head-to-head and tail-to-tail manners; i.e., the amino-termini of two polypeptide repeating units may be bonded together through a single cystine residue as may two carboxyl-termini since the linking groups at both polypeptide termini are identical.

☐ 45. Document ID: US 4654419 A

L20: Entry 45 of 52 File: USPT Mar 31, 1987

DOCUMENT-IDENTIFIER: US 4654419 A
** See image for Certificate of Correction **
TITLE: Synthetic polypeptides and antibodies related to epstein-barr virus nuclear antigen

Detailed Description Text (26):
Thus, even though the polypeptide denominated P62 (Table 1) that contains the sequentially repeating sequence -Ala-Gly-Ala-Gly-Gly-Gly-Ala-Gly-Gly-, that polypeptide additionally contains an -Ala-Gly-peptide at the carboxyl-terminus. As a consequence, there is no amino acid residue sequence that repeats tnroughout the polypeptide, and polypeptide P62 must be viewed as being a random copolymer and not a homoblock copolymer as are the poly(Ala.sub.x -Gly.sub.y) materials prepared by Brack et al. or the poly(Ser-Gly) materials prepared by Anderson et al. whose identical blocks of particular amino acid residue sequences repeat throughout the length of their polymers.

Detailed Description Text (71):
The present invention also contemplates a synthetic multimer containing a plurality of joined synthetic, random copolymer polypeptide repeating units wherein at least one of the repeating units is a polypeptide as described herein.

Detailed Description Text (76):
Alternatively, multimers can be prepared as a polymer of synthetic, random copolymer polypeptides used as monomers. As used herein, the term "polymer" in its various grammatical forms is defined as a type of multimer that contains a plurality of synthetic, random copolymer polypeptide repeating units that are joined together by other than peptide bonds.

Detailed Description Text (159):
The polymer (synthetic multimer) so prepared contains a plurality of the synthetic, random copolymer polypeptide repeating units that are bonded together by oxidizing cysteine (cystine) residues. Such polymers typically contain their polypeptide repeating units bonded together in a head-to-tail manner as well as in head-to-head and tail-to-tail manners; i.e., the amino-termini of two polypeptide repeating units may be bonded together through a single cystine residue as may two carboxyl-termini since tne linking groups at both polypeptide termini are identical.

☐ 46. Document ID: US 4589882 A

L20: Entry 46 of 52 File: USPT May 20, 1986

DOCUMENT-IDENTIFIER: US 4589882 A
TITLE: Enzymatically crosslinked bioelastomers

Abstract Text (1):
A method of repairing a natural elastic system in a human or animal body, which comprises replacing a damaged portion of the system with a shaped artificial elastomeric copolymer comprising an elastomeric component selected from the group consisting of tetrapeptide and pentapeptide repeating units or mixtures thereof wherein the repeating units comprise amino acid residues selected from the group consisting of hydrophobic amino acid and glycine residues and the repeating units exist in a conformation having a .beta.-turn and a crosslinking

component selected from the group consisting of amino acid and peptide residues of the formula ##STR1## wherein .alpha. represents a covalent bond or a peptide fragment containing 1-10 .alpha.-helix-forming amino acid residues, B represents a covalent bond or a petide fragment containing 1-10 amino acid residues, and n is an integer from 2 to 6; wherein the copolymer optionally comprises a chemotactic component selected from the group consisting of -Ala-Pro-Gly-Val-Gly-Val-, -Pro-Gly-Val-Gly-Val-Ala-, -Gly-Val-Gly-Val-Ala-Pro-, -Val-Gly-Val-Ala-Pro-Gly-, -Gly-Val-Ala-Pro-Gly-Val-, and -Val-Ala-Pro-Gly-Val-Gly- and is essentially devoid of peptide fragments which occur in natural elastin other than these elastomeric, crosslinking, and chemotactic components, is disclosed along with elastomeric copolymers suitable for use in the method of the invention and methods of synthesizing such bioelastomers.

Brief Summary Text (12):
replacing a damaged portion of said system with a shaped artificial elastomeric copolymer, which comprises an elastomeric component selected from the group of tetrapeptide and pentapeptide repeating units or mixtures thereof wherein said repeating units comprise amino acid residues selected from the group consisting of hydrophobic amino acid and glycine residues and wherein said repeating units exist in a conformation having a .beta.-turn and

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWMC | Draw Desc | Image

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☐ 47. Document ID: US 4575541 A

L20: Entry 47 of 52 File: USPT Mar 11, 1986

DOCUMENT-IDENTIFIER: US 4575541 A
**** See image for Certificate of Correction ****
TITLE: Polymer with sulfone-benzene appendage

CLAIMS:

1. Polymer supports or substrates for peptide synthesis characterized by insensitivity to moisture and alcohols in neutral solution, ready swelling in a variety of solvents, retention of form after repeated usage, a substantial lack of brittleness of tendency to crumble, and a rapid rate of reaction with amino acids or peptides having a free amine function, said polymers being compounds of the formula: ##STR8## wherein Z is polystyrene, or a copolymer comprising styrene and a divinyl benzene comonomer;

Y is selected from the group comprising nitro, acyl, carboxyl, formyl, cyano, carbalkoxy, arylsulfone, alkylsulfone, carboxyamide or halogen; and

R is hydroxy, aryloxy, alkoxy, halogen, formyloxy, acyloxy, cyano, amino, alkylamino, acylamino, carboxyamine, thiol, alkylthio, arylthio, aralkylthio or acylthio.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWMC | Draw Desc | Image

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☐ 48. Document ID: US 3985617 A

L20: Entry 48 of 52 File: USPT Oct 12, 1976

DOCUMENT-IDENTIFIER: US 3985617 A
** See image for Certificate of Correction **
TITLE: Immobilization of biologically active proteins with a polypeptide azide

Brief Summary Text (8):
The advantages of this invention are also available in copolymers in which the above units are connected by peptide bonds to repeating units of one or more netural and/or basic amino acids in the backbone of the molecule. Repeating units of a neutral amino acid make the polypeptide water-insoluble.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 49. Document ID: US 3948863 A

L20: Entry 49 of 52 File: USPT Apr 6, 1976

DOCUMENT-IDENTIFIER: US 3948863 A
TITLE: Solid, water-insoluble polypeptides having ionizable side chains

Brief Summary Text (7):
The units of formulas (I) and (II) are derived from aspartic, glutamic, or .alpha.-amino adipic acid, and they mdy constitute substantially the entire polypeptide body. The advantages of this invention, however, are also available in copolymers in which the above units are connected by peptide bonds to repeating units of one or more neutral amino acids in the backbone of the molecule.

CLAIMS:

3. A method as set forth in claim 1, wherein said polypeptide is a copolymer, said units being connected by repeating units of a neutral amino acid.

Full | Title | Citation | Front | Review | Classification | Date | Reference | Sequences | Attachments | Claims | KWIC | Draw Desc | Image

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☐ 50. Document ID: US 3795664 A

L20: Entry 50 of 52 File: USOC Mar 5, 1974

DOCUMENT-IDENTIFIER: US 3795664 A
TITLE: PROCESS FOR PREPARING PEPTIDES OR PROTEINS

OCR Scanned Text (1):
,@United States Patent Office 3@795@664 3,795,664 PROCESS FOR PREPARING PEPTMES OR PROTEINS Geoffrey William Tregear, Heidelberg, and Kevin John Catt, Mddle ark, Victoria, Australia, and Hugh David ..p Niall, Los Altos, Calif., assignors to Imperial Chemical Industries of Australia and New Zealand Limited, Melbourne, Victoria, Australia No Drawing. Continuation of abandoned

application Ser. No. 761,863, Sept. 23, 1968. This application Oct. 12, 1971, Ser. No. 188,487 CWms priority, application AustraHa, Sept. 21, 1967, 27,545/67 Int. Cl. C07c 103152; C07g 7/00 U.S. Cl. 260-112.5 11 CLiims ABSTRACT OF THE DISCLOSURE A process for preparing peptides or proteins by (1) reacting a protected amino acid with a graft copolymer having a chemically inert polymeric backbone and graftedon side chains of the formula: -CH-CH2 wherein X is at least one amino acid reactive group forming a bond with the first amino acid which is not cleaved during subsequent reaction of the first amino acid with a second amino acid and wherein Y stands for one or more optional substituents which is non-reactive to amino acids, to form a stable linkage between the protected amino acid and the copolymer; (2) deprotecting the resulting amino acid-copolymer complex; (3) coupling another amino acid or peptide to the deprotected group of the complex; (4) optionally repeating steps (2) and (3) and optionally cleaving the desired peptide from the resulting peptide-copolymer. This is a continuation of application Ser. No. 761,863 filed Sept. 23, 1968, now abandoned. This invention relates to processes for the preparation of peptides and proteins, and in particular to a process whereby a peptide is formed using a polymeric solid. The classical approach to peptide synthesis has yielded successes in recent years in that small amounts of certain peptides have been prepared by several methods. However, these procedures were not ideally suited to the synthesis of long chain polypeptides because the technical difficulties with solubility, steric (optical) specificity and purification became formidable as the number of amino acid residues increased. In an attempt to overcome some of these difficulties, Merrifield has described in JA.C.S., 85, 2149 (1963) the synthesis of a tetrapeptide which involved the stepwise addition of protected amino acids to a growing peptide chain which was bound to a solid chloromethylated crosslinked copolymer of styrene and divinyl benzene. Although this was a mjor improvement over the classical procedures, one difficulty with this method was that Merrifield's polymer was prone to swell to form sticky particles. The swelling led to the need for multiple treatments of the polymer between steps and the stickiness caused difficulties with filtration, washing and purification. Thus with gelatinous polymers of this type the unreacted amino acids, which are the expensive building stones to be assembled stereospecifically, become absorbed or adsorbed in the interstices of the polymer; consequently they must be removed in the desorption Patented Mar. 5, 1974 2 step and several washes are required each of which still leaves a proportion of the amino acid behind. In the synthesis of peptides involving the linking of as many as several dozens of amino acids and consequently as many sequential bonding reactions, the yield in each reaction, the undesired retention of unreacted residues from earlier reactions leading to by-products, and hence the complete removal of intermediates, the ease and the rate of washing are highly critical. 10 Even an apparently marginal improvement in yield, "cle . anness" of the reaction and ease and rate of washing, has an exponential effect on the overall yield, purity and rate of production over a sequence of, say, 5, 10 or 50 reaction cycles. Thus the overall yield from a sequence 15 of thirty steps is 21.4%, if each is performed with an efficiency of 95%, but 54.4%, if the efficiency is 98%. Accordingly, with higher peptides it is no exaggeration to say that an apparently marginal improvement in yield per step from, say, 95% to 98% may make the difference 20 between a laboratory and a technical preparation, and if at the same time as the yield per step is increased, the time for performing a step is decreased the probability of achieving a technical preparation is increased still further. When Merrifield's process is applied to peptides 25 of a large molecular size, reaction and subsequent removal from the interstices could become progressively more difficult and less efficient. Although peptides containing up to 55 amino acid residues have been made by Merrifield@s technique, the cost of the product could be 30 so high that these products are not competitive commercially with products from natural sources. A cheaper process is therefore desirable. In Australian patent application No. 4,671/66 there are described substituted graft copolymers which contain 35 on their surface at least one reactive group and which may be reacted with amino acids, peptides, proteins or nucleotides. These copolymers are solids and may be fabricated in a variety of desired shapes; for example, they may be made into semipermeable membranes, pel- 40 lets, discs, filters, tubes and rods of desired porosity. We have now found that certain of these surface-modified and internally inert polymers may be used to reduce the difficulties of the prior art in the preparation of peptides 45 or proteins by the stepwise addition of protected amino acids to a growing peptide chain or in the linking of a large peptide chain already so formed to other peptide chains to form a peptide or protein at improved overall yields and efficiencies. 50 Accordingly we provide a process for the preparation of peptides or proteins which comprises: (1) Reacting a first protected amino acid which, optionally, may be attached to a peptide or part of a peptide, with a copolymer which is characterized in that it

is a 55 graft copolymer of a chemically relatively inert polymeric backbone and grafted-on side chains comprising a multiplicity of mer units of the formula -CH-CH3 60 /1 X y 65 wherein X is at least one amino acid reactive group forming a bond with the first amino acid sufficiently strong not to be cleaved during subsequent reaction of said first amino acid or peptide with a second amino acid or pep- tide and wherein Y stands for one or more optional sub- 70 stituents which is non-reactive to amino acids, to form a stable linkage as defined between the protected amino acid and the copolymer;

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32795)664 4 (2) Deprotecting the amino acid or peptide-copolymercomplex formed by removing the protecting group; (3) Coupling at least one further protected amino acid or peptide with the deprotected reactive group of the first amino acid or peptide-copolyiner-complex obtained in (2); (4) Optionally, alternately repeating one or more times the removal step (2) of the protecting group from the last amino acid attached to the peptide chain- polymer complex and the coupling step (3) with yet a further amino acid or peptide; and (5) Optionally cleaving the desired peptide from the peptide-copolymer by rupture of one selected bond in the chain. By amino acid reactive group we mean a group capable of forming a chemical link of the specified stability with the amino acid. The peptides formed by our process may be used in several ways: the whole of the peptide may be cleaved from the copolymer; part of the peptide may be separated at a predetermined amide-link from the copolymer-peptide complex or finauy, in certain instances, the copolymel@peptide complex may be used as such, withoiit cleavage. The most preferred method is cleavage of the whole peptide from the copolymer. Accordingly the Iftiking groups X may be "cleavable" or- "non-cleavable." by "cleavable!' we mean a group sufficiently strong not to be cleaved during the coupling reaction with yet a further amin@o acid or during the amino group deprotecting step yet capable of being cleaved by a subsequent treatment not affecting the amide link between the said amino acids. By "non-cleavable groups" we mean that it is not possible to remove them from the copolymer without damage to the peptide chain or protein to which they are attached. Accordingly a preferred process according to this invention as defined above is characterized in that X is a cleavable amino-acid-reactive group forming with one reactive group of a first amino acid or peptide a bond sufficiently strong not to be cleaved during the subsequent coupling and deprotecting steps (2) and (3) with further amino acids or peptides yet capable of being cleaved by a subseqlient treatment not affecting the amide link between any one of the amino acids or peptides in the chain and characterized further in that, on completion of a sequence of alternate deprotecting and coupling steps (2) and (3) defined above, the whole of the peptide formed is cleaved from the copolymers. Cleavage is facilitated by the presence in the copolymer of non- reactive groups Y, such as alkyl, for example methyl or nitro. The latt6r group is particularly useful when cleavage is effected by ammonolysis. In a further process according to this invention the amino acid reactive group X is non- cleavable and forms with the amino acid a bond at least as stable as the amide link betwee:n the amino acids; a peptide of desired characteristics and length is built up by a sequence of alternate deprotecting and coupling steps (2) and (3) as described above; and cleavage of a desired fraction of the pep@de chain is achieved by enzymes acting specifically on certain peptide linkages. Optionally the residual peptide-copolymer complex may then be re-used as the starting point cf a further desired peptide chain. In yet another embodiment of this invention X is a non-cleavable aniino acid reactive group as defined and the copolymer-peptide complex built up as described above is used as such, without cleavage. The reactive group of the amino acid may be either the an-dno or the carboxy group or, when present, even sulphydryl, sulphur, hydroxy or phenyl groups. Preferred are the amino and carboxy groups; most preferred is the amino group. The various complementary amino acid reactive groups X in the copolymer e.g. XI to Xp. are, of course, chosen accordingly. Complementary pairs of reactive groups of the amino acid and the preferred cleavable group X are e.g. (1) The trihydrocarbyl, u5u4lly trialkyl ammonium salt of a protected amino acid and XI=-CH2CI, which groups may be reacted to form a methylene ester linkage in the manner described by Merrifield, I.A.C.S., 85, 2149 (1963); 5 (2) The amino group of an amino acid ester, protected by its ester group and 0 X2=-CH20-b-cl, 10 which is prepared from the bydroxymethyl group --CH20H and phosgene as described by L. Letsinger et al. [J.A.C.S., 85, 3045 (1963)]; and, less preferted, (3) The carbgxyl group of an amino acid, protected by 15 an ester group and Xs is --CH20H in the manner described by Bodansky et al. (Chem. & Ind. 1964 p. 1423). Pairs (1) and (2) are preferred, pair (1) is most preferred. Non-cleavable pairs of reactive groups in the amino 20 acid and amino acid reactive groups X are e.g. the amino group of a protected amino acid and a member of the

group X4 to X6, where X4=isothiocyanato, or X5=-COCI, or X6=a diazonium salt 25 + -N-=N-Z and where Z is the residue of a strong acid e.g. Cl-. A non-cleavable pair utilizing the carboxy group of the 30 amino acid comprises the latter and X7 where X7 iS -LNHR" used together with a carbodiimide coupling agent of the formula RN=C=NR' and wherein L is a linking group preserving the basicity of the amino group by separating it from the aromatic ring of the styrene 35 molecule and R and R', which may be the same or different, are not narrowly critical and may be cycloalkyl, alkyl or aryl. A further non-cleavable pair is a sulphydryl group in the amino acid and X3 where X8 is a mercuric group introduced into the polystyrene side chains by 40 diazotizing the styrene groups mercurating them in a known manner and destroying !he excess of diazo group. A preferred carbodiimide coupling agent is N,N-dicyclohexylcarbodiimide. R" may be alkyl, particularly lower alkyl having e.g. one to four carbon atoms. Methods of 45 effecting the peptidelinkages with X4, X5, X6 and X7 are known e g. from McKinney et al. (J. Immunology, 93, 232 (1964)], L. Letsinger et al. [JA.C.S., 85, 3045 (1963)], and Yagi et al. [J. Immunology, 85, 374 (1960)]. 50 By "Protected" we mean the term used in the art to indicate that at least one of the reactive groups of the ammo acid, for example the o:-amino, the a-carboxy or the non a-reactive groups, is temporarily inactivated by a readily cleavable group so as to control the attachment 55 of the first amino acid to the copolymer and of subsequent amino acids so as to attain the desired stereospecificity. When the first amino acid reacts with X through its carboxyl group, the amino group may be protected by a carbobenzoxy, a o-nitrophenylsulphenyl or a t-butyloxycar- 60 bonyl group; t-butyloxycar-bonyl is preferred. When the first amino acid reacts through its amino group, e.g. with Xs, the carboxy group is protected by a @hydrolyzable ester group e.g. a benzyl ester group. The techniques of protecting amino acids in peptide ;syntheses, the attach- 65 ment of the protecting groups to the an-lind acid and their subsequent cleavage from it are known "per se." Once the first amino acid or peptide is attached to one copolymer its alpha protecting group is removed and the liberated reactive group is coupled further with a further 70 protected amino acid. Here again, protecting groups may be carbobenzoxy, n- nitrophenylsulphenyl-, or most preferred, t-butyloxycarbonyl. All of these protected amino acids can be coupled in suitable known media, e.g. dimethylformamide or methylene dichloride, and once cou- 75 pled the protocting group may bc readily split by, for

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5 example, anbydrous hydrogen chloride in the presence of a suitable solvent, e.g. dioxan or acetic acid. A particularly preferred method of coupling amino acids is Sheehan's carbodiimide method [Sheehan et al., J.A.C.S., 77, 1067 (1955)]. Where it is undesirable to use the carbodiimide method, for example when amino acids such as glutamine or asparagine are being coupled, use may be made of the p-nitrophenol ester method known from Bodansky et al. (Chem. and Ind., 1964, p. 1423). The nature of the polymeric inert backbone to which the- polystyrene branches are grafted is critical for attainment of the technical advantages provided by this invention. The position of the active groups on the surface, which characterizes the graft copolymers of copending Australian patent application No. 4,671/66, is a marked advance in itself; for the use of these copolymers in syntheses according to the present invention the additional advantage arises that the ease of synthesis is the greater, the more inert the polymeric backbone is to the solvents and to the agents used. By inert we mean chemically inert to, non-solvated by and non-swellable or relatively non-swellable by the reaction medium. Thus preferred polymeric backbones are the polyphenylene oxides, polyimides, poly(paraxylylenes), poly(halofluoroalkylenes), for example poly(tetrafluoroethylene) and poly (trifluoromonochloroethylene), and phenol formaldehydes and polyolefines. The shape of the backbone polymers may take various forms; for example they may be made into powders, discs, tubes, rods or pellets having regular or irregular shapesSpherical or substantially spherical shaped particles, discs or pellets are preferred. In cases where the polymeric backbone has a density not greater than unity it is desirable to increase the density of the backbone by incorporating into the polymer by means known per se an amount of an inorganic inert filler having a density greater than unity. Suitable fillers may include, for example, oxides of titanium, lead, tin, zirconium, silicon; mineral earths and clays. By the use of the copolymers of Australian patent application No. 4,761/66 specified above we minimize swelling of the interior of the copolymers because of the inert nature of the backbone; we avoid excessive adsorption or absorption of the amino acids into the interstices of the copolymer from which long chain peptides are d'fficult to reinove; we reduce retention of mother liquor and hence achieve greater ease and rate of washings; reduce loss of greater purity than has hitherto been

possible; and we obtain an improved rati6 of desorption of the peptide or protein from the polymer. In addition the use of copolymers according to Australian patent application No. 4,671/66 offers a greater choice of amino acid reactive coupling groups than the polymers used in the prior art because cleavage on the surface requires less drastic treatment. We are also able to regulate the density of amino acid reactive sites on the surface of these copolymers and hence can adjust the statistical site distances to suit the size of the peptide or protein to be prepared. This designed spacial arrangement avoids hindrance of the peptides within the copolymer and/or hindrance between the growing peptide or protein chains on the surface. Solid articles fabricated from these copolymers in specially designed shapes have the advantage that their shape and size remains substantially unchanged when they are used in a large number of successive steps as media for the preparation of a peptide or a protein and the dffficulty of transferring the polymer-bound peptide chain from one reaction vessel to another is reduced substantially compared with the prior art polymers. This facilitates handling and offers a simple alternative to the technique of pumping a sequence of reagents to and from the reactor: the solid shaped copolymer with all desired groups attached to it may be simply transferred from 8,795,664 6 the porosity of the shaped polymer can be controlled, difriculties with solvent flow, Mtration and purification are reduced substantially. A preferred embodiment of this invention comprises: (1) Reacting solid phase poly(trifluoromonoethyle ne9-chloromethylstyrene) with the trialkylammonium salt of a first amino acid or peptide, the amino group of which is protected by an acid sensitive amino-protecting agent, preferably a t-butyloxycarbonyl group to form the 10 methylester of said acid; (2) Cleaving said protectingagent from the copolymeramino acid ester complex preferably by reating it with a hydrogen halide and forming the amine base from the resultant salt; 15 (3 Coupling to the amino acid ester-copolymer complex resulting from (2) at least one further amino acid or peptide having an acid sensitive amino-protecting group, preferably a t- butyloxycarbonyl group by means of a carbodiimide coupling group RN=C=NR' or, alterna- 20 tively, coupling to said complex a p-nitrophenyl-, N-hydroxy phthalimide-, N- hydroxysuccinimide- or a pentachlorophenyl ester of a protected amino acid; (4) Repeating the deprotecting step (2) and the coupling step (3) alternatingly with a number of selected 2,5 amino acids or peptides; and (5) Cleaving the peptide from the copolymer carrier preferably with anhydrous halogen halide, e.g. HBr in a non-aqueous acid. A particularly preferred embodiment comprises the use 30 of poly (tetrafluoroethylene-g-chloromethyl styrene) as the graft copolymer in the form of pellets or discs. Reaction conditions for the use of our copolymers in the individual steps are similar to those known from the prior art for the individual steps. Thus step (1) may 3,5 be carried out in a suitable solvent, e.g. methanol, under reflux over a prolonged period. The deprotecting step (2) is carried out with an inorganic halo acid, for example hydrochloric acid which has been dissolved in a highly pure, water-free inert organic solvent, for example dioxan 40 or acetic acid, at temperatures from about O' to 50' C. and preferably from 15' to 25' C. for periods of up to 8 hours, preferably from 30 minutes to 5 hours. The coupling step (3) is carried out in suitable organic sol- vents, for example methylene chloride, dimethylform- 45 amide or tetrahydrofuran. A preferred carbodiimide is N,N'-dicyclohexylr- arbodiimide. The coupling reaction is performed at temperatures from O' to 60' C. and prefer- ably from O' to 35' C. over periods up to 24 hours, preferably from 4 to 16 hours. 50 Cleavage of the bond between the linking group X and the carboxy group of the first amino acid of the peptide chain. to remove the syntjlesized peptide from the co. polymer, i.e. rupture of the benzyl ester link (step 5), may be achieved by treating the complex with an anhy- 55 drous inorganic balo acid for example hydrogen bromide in the presence of a carboxylic acid, e.g. acetic acid or trifluoroacetic acid. Cleavage may also be effected in a manner known from Lenard et al., J.A.C.S., 89, 181 (1967) using mixtures of hydrogen fluoride and anisole. r ,,o The linkage may also be cleaved by saponification with an alkylonic solution of an alkali metal hydroxide, or by ammonolysis or hydrazinolysis. In certain instances it may be desirable to separate from a peptide chain or a protein, portion of the chain without 65 cleaving the first amino acid from the copolymer. It is known that certain enzymes attack peptide chains and proteins at specific points of the chain. By suitable selection of the amino acids chosen to synthesize the peptide chain or protein by means of our invention and by ap- 70 propriate choice of enzyme it is possible to obtain a peptide or protein of desired length and characteristics. Our process is also suitable for the synthesis of other oligomers or polymers of defined sequence and structure based on amino acids or hydroxylic compounds such as one reaction medium to the other. Furthermore, since 7,5 polynucleotides and polysaccharides in a manner simi-

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3)795,664 15 amino acid with a second amino acid and wherein Y stands for one or more optional substituents which is non-reactive to amino acids, to form a stable link- age between the protected aniino acid and the co- polymer; (2) deprotecting the amino acid copolymer-complex formed by removing the protecting group; (3) coupling at least-one further protected amino acid with the deprotected reactive group of the first amino acid copolymer-complex obtained in (2); (4) optionally, alternately repeating one or more times the removal step (2) of the protecting group from the last amino acid attached to the polymer-complex and the coupling step (3) with yet a further amino acid; and (5) optionally cleaving the desired peptide from the resulting peptide-copolymer by rupture of one se- lected bond in the chain. 2. In a process for the preparation of peptides or pro- teins which comprises: (1) reacting,a first protected amino acid with a solid phase sur@face graft- copolymer to form a bond with said surface graft copolymer sufficiently strong not to be cleaved during subsequent deprotecting reaction and subsequent coupling reaction of said first amino acid with a second amino acid; (2) deprotecting the amino acid-copolymerformed by removing the protecting group; (3) coupling at least one further protected amino acid with the deprotected reactive group of the first amino acid-polymer obtained in (2); (4) alternately repeating one or more times the removal step (2) of the protectin- group from the last amino acid attached to resulting peptide chain-copolymer and the coupling step (3) with yet a further amino acid; and (5) optionally cleaving the desired Peptide from the resulting copolymer by rupture of one selected bond in the chain, the improvement which conlpnses using, as the copolymer, a solid graft copolymer comprising an inert polymeric backbone and a proteinreactive surface composed of polymeric side chains grafted onto said polymeric backbone and comprising a multiplicity of mer units of the formula -CH-CH2- wherein X is a protein-reactive group selected from the group consisting Gf isothiocyanato; the group -LNHR", L being an alkylene linking group preserving the basicity of the amino group, and R" being H or lower alkyl and said group - LNHR" being capable of coupling with the carboxylic acid group of an amino acid by, means of the carbodiimide linking reaction; chloromethyl; 0 -CH30H; -CH20-8-Cl; COCI carboxy and a diazonium salt -N=-NZ wherein Z is the residue of a strong acid and wherein Y stands for one or more optional substituents which 16 are non-reactive with proteins, the graft being essentially only on the surface of the polymeric backbone with the virtual absence of reactive groups inside said backbone and the amino a'cid being chemically bonded only to said surface graft through said substituent. 3. A process according to claim 2 wherein the inert polymeric backbone is selected from the group consisting of poly(halofluoroalkylenes) and polyolefins. 10 4. A process according to claim 2 wherein the inert polymeric backbone is poly(tetrafluoroethylene) or poly (trifluoromonochloroethylene). 5. A process according to claim 2 wherein the mer unit is styrene. 15 6. A process according to claim 2 wherein X is 0 -CH2CI, -CH2-0-bi -Cl or -CHJOH 7. A process according to claim 2 wherein the graft 20 copolymer is poly (tetrafluoroethylene-g-chloromethyl styrene). 8. In a process according to claim 2 wherein steps (1) to (5) comprise: (1) reacting solid phase poly(trifluoromonochloroeth- 2,5 ylene-g-chloromethyl-styrene) with the trialkylammonium salt of a first amino acid or peptide, the amino group of which is protected by an acid sensitive amino-protecting grolip to form an ester of said amino acid.or peptide with the chloromethylated 30 graft copolymer; (2) cleaving said protecting group from the copolymeramino acid ester complex by treating it with a hydrogen halide and forming the amine base from the resultant salt; 35 (3) coupling to the amino acid ester-copolymer com- plex resulting from (2) at least one further amino acid or peptide having an acid sensitive amino-protecting group by means of a carbodiimide coupling group; 40 (4) repeating the deprotecting step (2) and the cou- pling step (3) alternatingly with a number of selected amino acids or peptides; and (5) cleaving the peptide from the copolymer carrier. 9. A process according to claim 2 wherein the graft 45 ropolymer is a disc, pellet, or porous mass. 10. A process according to claim 2 characterized in that the process is automated. 11. A process according to claim 2 wherein the rupture step (5) is omitted and the peptide copolymer is the de-50 sired product. References Cited UNITED STATES PATENTS 3,390,144 6/1968 Kessler et al - ------ 260-112.5 55 OTHER REFERENCES Tilak et al.: Tet. Lett., 1968, 129,7 (F@bruary). Merrifield et al.: Anal. Chem., 38, 190 , 5 (1966). Letsinger et al.: (1), J.A.C.S., 85, 3045 (1963). co Letsinger et al.: (II), JA.C.S., 86, 5163 (1964). Catt et al.: Biochem. J., 100, 31c (1966). LEWIS GOTTS, Primary Exaniiner R. J. SUYAT, Assistant Examiner 65 U.S. Cl. X.R. 8 A

☐ 51. Document ID: US 3737412 A

L20: Entry 51 of 52 File: USOC Jun 5, 1973

DOCUMENT-IDENTIFIER: US 3737412 A
TITLE: METHYLOLATED OLEFIN-MALEIMIDE COPOLYMERS AND METHOD FOR PREPARING

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3,737,412 9 polymer having one N- (o-nitrophenylsulfenyl) alanyl ester unit (IV-B) CHS -C--CH-CH ---- CH- CH3 O=C @=0 \Nl CH3 N02 I I CH2-0-C-CH-NH- 8 lo per about 2.7 of the acetoxy-substituted units: (IV-C) CH3 I -C--CH--CH ---- CH- 15 CH3 O=C C=o \ N @H2-0-C-CHS 8 20 Treatment of the copolymer with dilute hydrochloric acid (ca. 0.01 N) removes the NPS group from the units (IV-B) to give a copolymer in which said units (rV-B) have been converted into the unblocked units: 25 (V-A) CH3 U-ti3 O=C C=O N CH3 1 30 CH2-0-C-@H-NH2 8 Reaction of thg, resulting copolymer with a 10% -excess of NPS glycine in dimethyl acetamide solution using an equimolar amount of dicyclohexylcarbodiimide as cou- 35 pling agent converted the units (V-A) of the copolymer into the dipeptide-containing units: (VI-A) CH3 40 -@.-CH-CH----CE[- I I I CE13 O=C C=O \ N CH3 N02 I 1 45 Cir2-o-c-cH-NH-C-CHt-NH-S (B) Treatment of a portion of the product (VI-A) with 1 N HCI in glacial acetic acid as described in Ex- 10 stituted isobutylene-maleimide copolymer, consisting essentially of the repeating unit: (VII-A) CH3 I --- ----- CH-CH ---- CH- CH3 O=c U=U 8H20C-CH2-NH-DPOC (B) Treatment of the product of A with 80% acetic acid- quantatively removes the DPOC blocking group in about 6 hours. These very mild conditions do not affect the ester-bond attachment to the carrier polymer. The peptide chain is then lengthened by coupling with DPOCAlanine in the manner described in Example 6. Stripping the dipeptide from the carrier resin is accomplished as in Example 6, the DPOC group being concurrently removed. It is to be understood that although the invention has been described with specific reference to particular embodiments thereof, it is not to be so limited, since change and alterations therein may be made which are within the full intended scope of tWs invention as defined by the appended claims. What I claim is: 1. A resinous copolymer having the repeating unit: -Z-CH ---- CH- O=C C=O N @H2-R -wherein Z is a bivalent hydrocarbon radical and R is a hydroxy group. 2. The process for the preparation of a resinous copolymer consisting essentially of the repeating unit: -Z-CH ---- CH- I I O=C C=O N @H20H comprising treating with formaldehyde a resinous copolymer consisting essentially of the repeating unit: -Z-CH ---- CH-O=C @=0 \ N / H ample 3 resulted in the simultaneous removal of the NPS 5o wherein Z is a bivalent radical. a-amino blocking group and the essentially - quantitative 3. The process of claim 2 in which Z is isobutylene. stripping of the dipeptide glycine-alanine from the carrier resin. (C) A second portion of the product VI-A is treated U NITED S TATES P ATENTS wi th 1.0 M aqueous piperidine using a 5% slurry by 5 5 w eight. After stirring for 30 hours, the insoluble resin is 2, 146,209 2/ 1939 G raves -- ------------ 2 60-2 re moved from the mixture by filtration and the product 2, 381,020 81 1945 W ilkes -- ------------ 8- 142.5 NPS-Glycine-alanine, is recgvered substantially quanta- 2,971,939 2/1961 Baer ---------- 260-32.8R X tively by lyophilization of the aqueous solution. 3,231,533 1/1966 igarrett et al ------ 260-72R X EXAMPLE 7 60 3,296,209 1/1967 Mark ------------ 260-67.5 3,317,476 5/1967 Sellet ---------- 260-72 R (A) A dimethylformamide solution of - N-hydroxy- 3,422,074 1/1969 Ishida et al - ------ 260- 67.5 methyl-substituted isobutylene-maleimide copolymer 3,429,947 2/1969 Eygen et al - -------- 260- 836 (II-A of Example 2) is mixed with I)-d iphenylisopropyl- OTHER REFERENCES Chem. Abstract s, Vol. 63, 19659' 8496g. Journal of Polymer Science, Vol. 40, 195.9, pp. 227231, Goethals et al. HOWARD E. SCHAIN, Primary Examiner U . S . C l . X . R . 260-8.78 A, 112.5 oxycarbonylglycine (DPOC-glycine) in a quantity suf- 65 ficient to acylate the hydroxyl groups of said copolymer. The above-described Sheehan's reagent is added in equimolar amount to the resulting mixture for activation of the carboxy group. After stirring overnight at room temperature, the origin@lly clear solution shows separation 70 of by-product urea. After a 20 hr. reaction time, filtration of the resulting reaction niixture and precipitation of the filtrate from absolute ethanol yields the substantially pure BOC-glycyl ester of N-

hydroxymethyl-sub- References Cited

☐ 52. Document ID: US 3578641 A

L20: Entry 52 of 52 File: USOC May 11, 1971

DOCUMENT-IDENTIFIER: US 3578641 A
TITLE: RESINOUS ESTERS OF POLYMERIC N-HYDROXYIMIDES

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. U-flited States Patetit Office 315782641 3,578,641 RESINOUS ESTERS OF POLYMERIC N-HYDROXYIMIDES John H. Johnson, Kirlwood, Mo., assignor to Monsanto Company, St. Louis, Mo. No Drawing. Filed Apr. 1, 1968, Ser. No. 717,987 Int. Cl. C08g 20138 U.S. Cl. 260-78 6 Claiins ABSTRACT OF THE DISCLOSURE Esters of N-bydroxy-sL?bstituted olefin-maleimide copolymers and N-blocked a,-amino carboxylic ac-lds or peptides; the method of producing said esters; and use of said esters in peptide synthesis which comprises condensing the ester with a-@i a- amino carboxylic acid or a first peptide or an ester or amide of said acid or first peptide to obtain a second peptide and re- encrated Nhydroxy-substituted olefin-maleimide copolymer. Also disclosed is the removal of the N-blocking from the peptide esters of said N-hydroxy-substituted copolymers and intramolecular cyclization of the unblocked ester to give cyclic peptides. BACKGROUND OF THE INVENTION (1) Field of the invention New polymers and use tliereof in peptide synthesis. (2) Background of the i-.ivention Resinous polymers have been frequently us-.d in peptide synthesis. Thus, in the Merrifield solid phase method (R. B. Merrifield, J. Amer. Chem. Soc., 85, 2149 (1963) and Biochem., 3, 1385 (1964), and G. R. Marshall and R. B. Merrifield, Biochem., 4, 2394 (1965)), a C-terminal amino acid havin.- the cc-amino group blocked is attached to an insoluble, polymeric resin (cross-linked chloromethylated polystyrene). Subsequent amino acids are attached seqtientially on the resulting insolitble complex until the desired peptide is completed. Since the growing peptide is insolubilized by the bond with the polymer, excess reactants and waste products may be removed by vigorous washin@. The peptide is then stripped from the complex, e.g. by treatment with hydro.-en fluoride. Purification of the peptide is conducted after it has been detached from the polymer-peptide complex. Tiie present invention, wherein said amino acid or peptide esters of the polymeric N-hydroxyimides are used in peptide synthesis, differs from the Merrifieldniethod in that it enables preparation of the desired peptide with necessary side-chain blockin.- -roups intact, thus permittin.@ subsequent peptide couplin.- reactions and selected chemical modifications with a minimum of undesired side reactions. Such protecting groups are generally removed in the process required by Merrifield to strip the peptide from the resin employed by him. Also, in a reverse-type of the Merrifi@- ld synthesis, Patchornik and coworkers (J. Amer. Chem. Soc., 88, 3164 (1966)) have attached any of several Nblocked amino acids to an insoluble copolymer of nitrated polystyrylphenol. The product of this attachment then serves as a reservoir for amino acids that are to be added to amino acids, their esters or peptides. The present invention differs from Patchornik in providing a linkage between aminc) acid and polymer which is extremely labile; hence very short contact time with the reservoir resin complex is perniitted: in the present process minutes or seconds are reqtiired as compared to hours for the Patchomik method. This invention also provides a novel method of preparing cyclic peptides. This is accomplished by preparing an ester of an N- blocked polypeptide and the N-hydroxy- Patented May 11, 1971 2 substituted olefin-maleimide copolymer, and subsequently removing the N-blocking from the peptide moiety to obtain the regenerated polymer and the cyclized peptide. SUMMARY OF THE INVENTION 5 This invention provides a method for the rapid formation of peptides in substantially quantitative yields, with minimal needs for product purification and with retention of desirable side chain blocking groups. These results have 10 been achieved by employing as starting materials, Nhydroxy- substituted copolymers of maleimide and a mono-olefinic compound selected from the class consisting of the lower aliphatic mono-

olefins, mono-vinyl-substituted aroniatic compounds, mono-vinyl-substituted 15 heterocyclic compounds, vinyl alkanoates, and vinyl alkyl and divinyl ethers. According to the invention, said hydi-oxy- stibstituted copolymers are esterified with an Nblocked a- amino carboxylic acid or peptide to give re sinous copolymers compounds having the repeating 20 unit -X-CH-CH0=0 C=O \ N 25 0=@-Z-NH-T wherein X denotes an alkylene radical having from 2 to 12 carbon atoms or such a radical carrying as a sub- 30 stituent a radical selected from the class consisting of aryl and alkaryl radicals of ftom 6 to 9 carbon atoms, heterocyclic nitrogen radicals of from 5 to 7 carbon atoms, carboalkoxy radicals of from 2 to 5 carbon atoms, and alkoxy radicals of from I to 5 carbon atoms; Z denotes 35 the moiety of an a-amino carboxylic acid or of a peptide which brid.aes the terminal amino -roup with th-. terminal carboxylic group of said amino acid or peptide, and T is a radical which blocks the reactivity of the amino group in which it is- present. 40 The above-depicted compound is an extremely reacti-,,e ester. When it is contacted with an amino carboxylic acid or peptide wherein the amino group is unblocked, e.g. with a compound of the formula H2N-Z-COOH, said reactive ester is cleaved, with regeneration of the N-hy- 45 droxy-substituted polymer -X-CH-CH O=c C=o \Nl 50 I ou n wliere ii denotes the degree of polymerization and forma- tion of the N-blocked peptide 55 T-NH-Z-CO-NFI-Z'-COOH wherein Z' is independently selected from the same groiip as Z. After removing the N-block,ng, the residual dipeptide may be used for further reaction with other reactive esters, i.e. the N-bloelced amino acid or peptide 60 ester of the N-hydroxyimide copolymer. Alternatively, the N- blocked peptide can be used to esterify the N-hydroxy- subtsituted polymer to give another highly reactive ester: 65 U=U U=o N 70 u@u-ZI-NH-CO-Z-NII-T This reactive ester can be used with an amino carboxylic acid or peptide wherein the amine group is unblocked to

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3)5782641 5 carbodiimides include dicyclobexylcarbodiimide, I-ethyl3-(3- dimethylaminopropyl) carbodiimide, I - cyclohexyl-3(2-morpholinoethyl)carbodiimide, etc. The latter two water-soluble carbodiimides are commonly furnished as their respective salts; e.g. the frequently used "Sheehan's reagent" is a toltienesulfonate of said morpholino compound. Generally, reaction occurs at ordinary room temperature; i.e. neither heating nor coolin.- is usually required. However, the reagtion may be conducted at O' or below if required to protect the peptides. The liquid medium in which the acylation is, conducted will generally be water or a polar solvent. The acylated polymer is very reactive. It should be stored under substantially anhydrous conditions to prevent slow, progressive hydrolysis, and it is rapidly attacked by am,monia and amines. The acylated polymer is readily cleaved upon treatment with an a.-amino carboxylic acid or a peptide (including the- C-terminal esters or amides thereof), with condensation of the cleaved fragment (which may be an amino acid or peptide moiety) and the attacking amino acid or peptide- derivative. This condensation builds up the peptide chain, a new peptide bond being formed by linking the previously attached moiety with the attacking moiety. For example, a dipeptide is built up as follows, employing N-hydroxy-substituted ethylene-maleimide copolymer as carrier resin: CH2CH2-CH-CH I I = BOC-N-Z-COOH (1.3 moles) O=C C= 0 + N, N-dimethyliormamide N Carbodiimide (1.3 moles) I room temperature uti n CH2CH2CH-C I I O=C C=O N O=u-z -iN.U-b 0 0- n In addition to the acylated polymer (II), a substituted urea, derived from the carbodiimide, is formed as byproduct. The acylated, reactive polymer behaves as follows with an amino acid compotind such as the mietbyl ester of glycine: (II) + H2N-CH2C 0 0 CH3 CH013, solvent 0 0 II (I) + BOC-NH-Z-C-NHciE[@8ocir, (iii) The blocking group BOC of product (111) can be removed in the customary manner which is used for removing such groups in amino acid and peptide cehmistry; e.g. by reaction with dilute acids, bydrogenation, reaction with nucleophilic agents, etc. For example, peptide synthesis can proceed with product (III) by treating it with hydrochloric acid-acetic acid to remove the BOC group, and subsequent use of the unblocked (111) with a reactive ester of the type (II). Subsequent removal of the N-blocking grOUP which will be present in the N-terminal end of the new peptide, makes possible successive additions of amino acids or peptides. In the normal practice of the invention, an excess of the amino acid or peptide attached to the resin, relative to the attacking amino acid or peptide is employed. This may range from five percent to,several hiindred percent, being practically limited in the upper range by economics. However, it should be recognized that such resins can be reused until they can no long,-r supply the excess residues required, at which time they may be regenerated to their initial state of effectiveness by repeatin.- the acylation conversion step (e.g. (I) to (II)). Any seqiience of amino acid or peptide fragments may be formed. For example, reaction of N-hydroxy-substi- 6 tuted butene-maleimide copolymer with N-blocked glycine gives a reactive, polymeric ester which, upon contact with alanine,

gives the N-blocked product Gly-Ala. After removal of the N-blocking, it can be reacted with another mole of a reactive, polymeric ester which had been prepared by reacting N- hydroxy-substituted ethylene-maleimide copolymer with N-·carbobenzyloxyleucine to give the N-blocked product CBZ-Leu-Gly-Ala. After removal of the N-terminal block, this ternary heteropolypeptide 10 may be reacted,with another mole of a reactive polymeric ester, e.g. one which bad been prcpared by reaction of N-hydroxy-substituted ethylenemaleimide copolymer with an N-blocked a-aminocarboxylic acid as phenylalanine, and the above procedure repeated. 15 The peptide products are also useful in synthesis of new peptides by employin@, the N-blocked products as the acylating agents for preparing reactive esters from Nhydroxy-substituted olefin-maleimide copolymers. For example, the N-blooked product CBZ-Leu-Gly-Ala ob- 20 tained as described above can be used to esterify the Nhydroxy-substituted ethylene-maleimide copolymer to give the reactive, polymeric ester: -CH2CH2-CH-CH- I 25 O=C @=0 N 0 I O=C-Ala-Gly-Leu-CBZ (IV) 30 (I) may then be used to form a new peptide by reaction with an amino carboxylic acid or peptide or ester or amide thereof. (IV) may also be used to give a cyclic ester. After unblocking the N-terminal residue, the resultant free amine attacks the C-terminal active ester forming a cyclic 35 peptide with regeneration of the polymeric N-hydroxyimide. A convenient, practical means of conducting the presently provided peptide synthesis comprises passing a solu- 40 tion of the attacking residue (amino acid or peptide) over a column pack-ed with selected resin-carrier having the selected amino acid or peptide attached. The solvent system is such that the resin-carrier is insoluble in the solvent chosen. With cross-linked carrier resins, good solvents for the non-cross-linked polymer derivatives can be 45 used. It will be found generally, that the common solvents such as the liquid hydrocarbons, the chlorinated hydrocarbons, the aromatic hydrocarbons and alcohols or selected mixtures thereof are useful when it is desired to use this solvent/nonsolvent technique. Solvents such as 50·dimethylformamide, dimethylacetamide, etc., are useful in combination with cross-linked carrier resin complexes. Water can be a very useful solvent, either alone or in combination with solvents such as dimethylformamide or dimethyl sulfoxide, when the water-soluble carbodiimide 55 activating a,-ents are employed. A continuous means of operation, whereby long peptide chains of substantially any sequence are formed without need of isolating intermediate products, comprises a series of columns, each column being a reservoir for a 60 particular amino acid or peptide. The N-blocking group is one which can be conveniently removed in the stream between the columns. A good example of such a blocking group is the t-butyloxycarbonyl group, in that it decomposes in acid media to yield the readily removed gases, 65 isobutylene and carbon dioxide. The columns are lined up in the desired brder of amino acids to be incorporated into the peptide, and the solvents are selected according to the products employed. Once again, use of- pre-crosslinked carrier resins permits a wider choice of solvent. 70 The present process thus provides a means of preparing any peptide from a variety of amino acids in any sequence. As more and more of the naturally occurring proteins, including hormones and enzymes and biologicallyactive fra.- ments thereof are chemically characterized, pro- 75 vision of the present method for the facile synthesis there-

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